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Featured Products

10 Vials with Fused Inserts



- Most vials can be silane treated
- Vials can be sold by the pallet or the case

17 Low Adsorption Vials



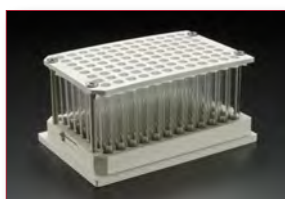
18 Agilent Certified Vials



21 Vial Accessories



CHROM TECH RELATED PRODUCTS



Want to convert to 96 well plates, but concerned with evaporation or plastic 96 well plates?
See **Aluminum Block with 96 Glass Inserts**, page 24



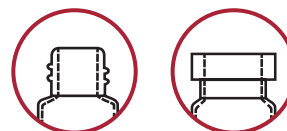
Solvent Reservoirs, page 266

Notes from the Support Desk

Crimp Cap vs. Screw Cap

Based on chromatography experience, crimp-cap vials tend to be best for GC and GC/MS applications, while screw-cap vials are generally used for LC and LC/MS applications. However, your specific application—as well as your personal preference—are also factors to consider.

Although both types of caps deliver a good seal, crimp caps provide additional security for food, forensics, and other applications for which you want to avoid sample tampering. We also recommend a crimp-cap vial if you are working with volatile compounds.



Septa Selection Guide

MATERIALS	COMPATABILITY	INCOMPATABILITY	RESEALABILITY
Silicone	Alcohol, acetone, ether, DMF, DMSO	ACN, THF, chloroform, pyridine, benzene, toluene, hexane, heptane	Very Good
PTFE/Silicone PTFE/Silicone/PTFE	PTFE resistance until punctured then septa or liner will have silicone compatibility		Very Good
Rubber (Natural Butyl)	ACN, acetone, DMF, alcohols, Dietyamine, DMSO, Phenol	Chlorinated solvents, aromatics, hydrocarbons, carbon disulfide	Excellent
Natural PTFE/Natural Rubber Butyl PTFE/Butyl	PTFE resistance until punctured then septa or liner will have rubber compatibility		Very Good
Viton	Chlorinated solvents, benzene, toluene, alcohols, hexane, heptane	DMF, DMSO, ACN, THE, pyridine dioxidane, methanol, acetone	Very Good

Glass Standard Mouth Vials & Closures (8-425)



	2 mL		2 mL W/GRADUATED MARKING	
SEPTA	CLEAR	AMBER	CLEAR	AMBER
CONVENIENCE PACK (CP) INCLUDES VIAL & STANDARD PRE-ASSEMBLED CAP & SEPTA, 100/PK				
PTFE/Silicone/PTFE, 0.040" (CTC-1257)	CP-1257	CP-1257A	CP-1257GS	CP-1257GSA
PTFE/Silicone, 0.065" (CTC-1254)	CP-1253	CP-1253A	CP-1253GS	CP-1253GSA
CHROM TECH VIAL ONLY, 100/PK				
N/A	408213	404810	CTV-1208MS	CTV-1208MSA

TECH TIP

8-425 thread is the original standard opening screw thread vial for chromatography. We recommend the 9 mm thread for most customers.

The 9 mm thread (opposite page) is autosampler compatible and offers a 40% larger opening, simplifying pipetting and other routine functions.

Standard Mouth Limited Volume Vials (8-425)

	LIMITED VOLUME VIAL ONLY					
PART NO	CTV-1202	CTV-8009	CTV-5195	CTV-5195A	CTV-1295	11-STVG
VOLUME	100 µL	100 µL	350 µL	350 µL	1.1 mL	1.1 mL
MATERIAL	PP	TPX	Glass/Polymer*	Glass/Polymer*	Glass	Glass
COLOR	—	—	Clear	Amber	Clear	Clear
QTY	1,000/pk	1,000/pk	100/pk	100/pk	100/pk	500/pk

*Glass insert, polymer outer vial shell

TECH TIP

All glass vials available as deactivated, contact Chrom Tech for a quote.

Vial Inserts for Standard Opening Vials

	INSERTS FOR STANDARD OPENING VIALS, 100/PK						
PART NO	CTI-2405	CTI-1410	200238	CTI-2410	CTI-2510	CTI-1510	1062 (1,000/pk)
VOLUME	50 µL	100 µL	100 µL	100 µL	100 µL	100 µL	300 µL
COLOR	Clear	Clear	Clear	Clear	Natural	Natural	Clear
MATERIAL	Glass	Glass	Glass	Glass	Polypropylene	Polypropylene	Glass

Pre-Assembled Caps & Septa for Standard Opening Screw Thread Vials (8-425)

TECH TIP

To denote a color other than the standard color, add the letter below to the end of the part number:
B=blue, G=green, R=red, Y=yellow, N=natural

PRE-ASSEMBLED CLOSURE (CAP & SEPTA) 100/PK

PART NO	SEPTA	CLOSURE
CTC-1290	w/10 mil PP septa (all-in-one)	Clear Top Seal
CTC-1257	PTFE/Silicone/PTFE, 0.040"	Black
CTC-1254	PTFE/Silicone, 0.065"	Black
CTC-1272	PTFE/Silicone	Black Top Hat*
CTC-1282	PTFE/Silicone	Yellow Top Hat*
408455	PTFE/Silicone, 0.045" (Shimadzu)	Yellow

*Provides a physical lock to assure septa stays intact.

SEPTA ONLY & EMPTY CAP

PART NO	SEPTA	QTY
400581	PTFE/Silicone, 0.065"	100/pk
408037	PTFE, 0.010"	1,000/pk
657008	PTFE/Silicone w/Slit, 0.060"	100/pk
407508	PTFE/Silicone/PTFE, 0.040" w/Slit	100/pk
406008	PTFE/Silicone/PTFE, 0.040"	100/pk
531008	Open hole cap (septas sold separately)	1,000/pk
536008	Solid Top (storage) PTFE/F217 lined	100/pk

Glass Wide Mouth Vials & Closures (9 mm)



	2 mL		2 mL W/GRADUATED MARKING	
SEPTA	CLEAR	AMBER	CLEAR	AMBER
CONVENIENCE PACK (CP) INCLUDES VIAL & STANDARD PRE-ASSEMBLED CAP & SEPTA, 100/PK				
PTFE/Silicone (CTC-0952)	★ CP-0952	CP-0952A	CP-0952GS	CP-0952GSA
PTFE/Silicone w/Slit (CTC-0955)	★ CP-0955	CP-0955A	CP-0955GS	CP-0955GSA
PTFE/Silicone/PTFE (CTC-0957)	CP-0957	CP-0957A	CP-0957GS	CP-0957GSA
PTFE/Rubber (CTC-0956)	CP-0956	CP-0956A	CP-0956GS	CP-0956GSA
CHROM TECH VIAL ONLY (CTV), 100/PK				
N/A	CTV-1209	CTV-1209A	CTV-1209GS	CTV-1209GSA

★ **TOP SELLER!** 9 mm vials are recommended for use with autosamplers

TECH TIP

To denote a color other than the standard color, add the letter below to the end of the part number:
B=blue, G=green, R=red, Y=yellow, N=natural

PRE-ASSEMBLED CLOSURE (CAP & SEPTA)

SEPTA	BLACK CAP & SEPTA	BLUE BONDED CAP & SEPTA	MAGNETIC CAP
PTFE/Silicone	CTC-0952 ¹	CTC-0952-BOND ²	CTM-0952 ¹
PTFE/Silicone w/Slit	CTC-0955 ¹	CTC-0955-BOND ²	CTM-0955 ¹
PTFE/Silicone/PTFE	CTC-0957 ¹	—	CTM-0957 ¹
PTFE/Rubber	CTC-0956 ¹	—	CTM-0956 ¹
Viton®	CTC-0902M ²	—	—
PTFE/F217 lined	536009 ² (storage cap)		

1) 100/pk 2) 1,000/pk

Glass Wide Mouth Limited Volume Vials & Closures (9 mm)

	300 µL W/FUSED INSERT		1.5 mL RECOVERY VIAL		1.2 mL MAX RECOVERY
SEPTA	CLEAR	AMBER	CLEAR	AMBER	CLEAR
CONVENIENCE PACK (CP) INCLUDES VIAL & BONDED PRE-ASSEMBLED CAP & SEPTA, 100/PK					
PTFE/Silicone (CTC-0952-BOND)	CP-0952-03	CP-0952A-03	CPH-0952	CPH-0952A	CPD-0952
PTFE/Silicone w/Slit (CTC-0955-BOND)	CP-0955-03	CP-0955A-03	CPH-0955	CPH-0955A	CPD-0955



CHROM TECH RELATED PRODUCTS



985800

Wheaton 12 mm rack, 5/pk

Polymeric Wide Mouth Limited Volume Vials (9 mm)

	POLYMERIC LIMITED VOLUME VIAL ONLY, 100/PK					
PART NO	CTV-0910P	CTV-0910T	CTV-0930P	CTV-0950P	CTV-0970P	CTH-0900P
VOLUME	100 µL	100 µL	300 µL	500 µL	700 µL	1.5 mL
MATERIAL	PP	TPX	PP	PP	PP	PP

TECH TIP

The polypropylene provides added safety by eliminating vial breakage.

Now available in Black for light sensitive samples. To denote black, add BL to the end of the part number.

Mass Spec Quality Wide Mouth Vials & Closures (9 mm)

	VIRGIN PP VIAL, 1,000/CS		2 mL pH NEUTRAL GLASS VIAL, 1,000/CS		
SEPTA	300 µL	700 µL	CLEAR	AMBER	
PTFE/Silicone	CP-0952-03PMSQ	CP-0952-07PMSQ	CP-0952-MSQ	CP-0952A-MSQ	
PTFE/Silicone w/Slit	CP-0955-03PMSQ	CP-0955-07PMSQ	CP-0955-MSQ	CP-0955A-MSQ	

MS Virgin Polypropylene Vials

- ➔ No Clarifier
- ➔ No Mold Release
- ➔ No Antioxidants

MSQ Septa

- ➔ No Adhesives/Pigments
- ➔ Retainer ring locks septa in cap

VIALS Wide Mouth 11 mm Snap Vials | 12 x 32 mm

Glass Snap Seal Vials (11 mm)

	2 mL	2 mL W/GRADUATED MARKING	300 µL W/ FUSED INSERT	1.5 mL HIGH RECOVERY	1.2 mL MAX RECOVERY	
VIAL ONLY, 100/pk	CLEAR	AMBER	CLEAR	AMBER	CLEAR	
	CTV-1108	CTV-1108A	CTV-1108GS	CTV-1108GSA	CTV-1830	CTH-1800

Snap Ring™/Crimp Top Vials (11 mm)

SNAP RING/CRIMP TOP VIAL ONLY, 100/PK										
PART NO	CTV-1103	CTV-1204	CTV-8008	CTV-1205	CTV-1203	CTV-5190	CTV-5190A	CTV-1206	CTV-1211	CTV-1108P
VOLUME	2 mL	100 µL	100 µL	250 µL	300 µL	350 µL	350 µL	500 µL	700 µL	1.5 mL
MATERIAL	Glass	PP	TPX (1,000/PK)	PP	PE	Clear Glass/ Polymer*	Amber Glass/ Polymer*	PP	PP	PP

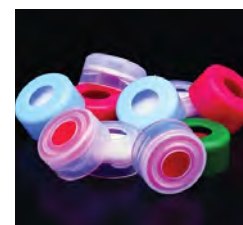
PP = Polypropylene TPX = Polymethylpentene (more transparent than PP) PE = Polyethylene

*Glass insert, polymer outer vial shell

11 mm Snap Top Closures

11 mm SNAP TOP CLOSURES, 100/PK						
SEPTA	CLEAR	BLUE	GREEN	RED	YELLOW	POLYPROPYLENE GC CAP*
10 mil PE (1000/pk)	CTC-5200M	—	—	—	—	—
10 mil PE w/starburst	CTC-5201	—	—	—	—	—
10 mil PTFE	CTC-1306	CTC-1306B	CTC-1306G	CTC-1306R	CTC-1306Y	CTC-1306P
PTFE/Rubber	CTC-1308	CTC-1308B	CTC-1308G	CTC-1308R	CTC-1308Y	—
PTFE/Silicone	CTC-1305	CTC-1305B ■ CTC-1305B-LK	CTC-1305G	CTC-1305R	CTC-1305Y	CTC-1305P
PTFE/Silicone w/starburst	CTC-1381	—	—	—	—	—
PTFE/Silicone w/slit	CTC-1370	CTC-1370B	CTC-1370G	—	—	CTC-1370P
PTFE/Silicone/PTFE	CTC-1307	CTC-1307B	CTC-1307G	CTC-1307R	CTC-1307Y	CTC-1307P
PTFE/Silicone/PTFE w/starburst	CTC-1380	—	—	—	—	—
Viton® (1000/pk)	CTC-1302	—	—	—	—	—

*GC Snap Top Caps were developed to handle the most volatile samples, providing a liquid airtight seal to the vial. Simply snap on the cap and an evaporation-proof seal of a crimp cap is achieved.



TECH TIP
“-LK”
(Locked in Septa)

Vial Inserts for Wide Mouth Vials

INSERTS FOR 9 MM SCREW THREAD, SNAP SEAL, SNAP RING & WIDE MOUTH CRIMP VIALS, 100/PK						
PART NO	CTI-9405	TS-410	CTI-9420	CTI-9425	CTI-9525	405342
VOLUME	50 µL	100 µL	200 µL	250 µL	250 µL	300 µL
COLOR	Clear	Clear	Clear	Clear	Natural	Clear
MATERIAL	Glass	Glass	Glass	Glass	Polypropylene	Glass

TECH TIP
These inserts are designed to fit the following wide mouth vials:
9 mm Screw Thread
Snap Seal
Snap Ring™
Wide Mouth Crimp

Glass Wide Mouth Crimp Top Vials (11 mm)

	2 mL	2 mL W/GRADUATED MARKING	300 µL W/FUSED INSERT	1.5 mL HIGH RECOVERY	1.1 mL CHROMACOL		
VIAL ONLY, 100/pk	CLEAR	AMBER	CLEAR	AMBER	CLEAR	CLEAR	
	CTV-1104	CTV-1104A	CTV-1104GS	CTV-1104GSA	CTV-2030	CTV-2032	CTH-1400

Uses inserts for wide mouth vials, see pg 10

11 mm Crimp Cap Closures (fits standard and wide mouth crimp top vials)

11 mm CRIMP CAPS, 100/PK

SEPTA	SILVER	BLUE	GREEN	RED	GOLD	MAGNETIC	POLY CRIMP™*
PTFE/Natural Rubber	CTC-1108 (1000/pk)	408063	408064	408007	408065	—	554011
PTFE/Seal 2000	CTC-1109 (1000/pk)	—	—	—	—	—	—
PTFE/Silicone	515011	—	—	—	—	515011M	555011
PTFE/Silicone/PTFE	405394	—	—	—	—	—	—
10 mil PP	512011	—	—	—	—	—	—
10 mil PTFE	—	—	—	—	—	CTC-1101M	551011

*The Poly Crimp is made out of plastic that fits crimp top vials

TECH TIP | Seal 2000

Seal 2000 is a specially formulated rubber compound which is significantly cleaner than the natural rubber product. The Seal 2000 septa is the recommended option to minimize background interference for your GC analysis.



Glass Standard Opening Crimp Top Vials (11 mm)

	2 mL	2 mL W/GRADUATED MARKING		
VIAL ONLY, 100/pk	CLEAR	AMBER	CLEAR	AMBER
	CTV-1100 CTV-1100M (1000/pk)	CTV-1100A	CTV-1100GS	CTV-1100GSA

TECH TIP

These 11 mm standard opening crimp top and wide mouth crimp top vials are both designed to fit the 11 mm crimp cap closures above.



W225301
Wheaton 11 mm
EZ Crimper




985800
Wheaton 12 mm rack, 5/pk

Vial Inserts for Standard Opening Vials

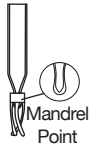
INSERTS FOR STANDARD OPENING VIALS, 100/PK

PART NO	CTI-2405	CTI-1410	200238	CTI-2410	CTI-2510	CTI-1510	1062
VOLUME	50 µL	100 µL	100 µL	100 µL	100 µL	100 µL	300 µL
COLOR	Clear	Clear	Clear	Clear	Natural	Natural	Clear
MATERIAL	Glass	Glass	Glass	Glass	Polypropylene	Polypropylene	Glass

Glass Vials & Closures (13-425 mm Thread, 15 x 45 mm)

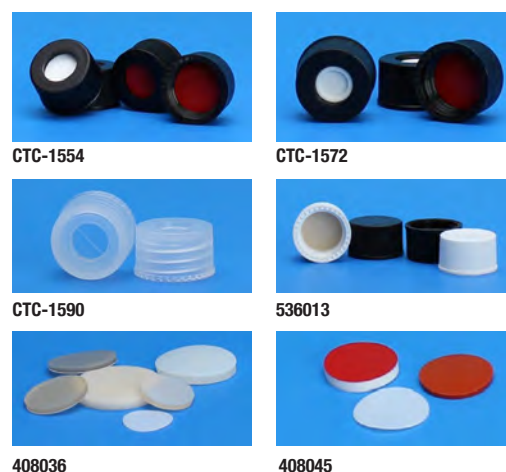


	4 mL		4 mL W/GRADUATED MARKING		3.1 mL HIGH RECOVERY
SEPTA	CLEAR	AMBER	CLEAR	AMBER	
CONVENIENCE PACK (CP) INCLUDES VIAL & STANDARD PRE-ASSEMBLED CAP & SEPTA, 100/PK					
PTFE/Silicone (CTC-1554)	CP-1554	CP-1554A	CP-1554GS	CP-1554GSA	CPH-1552
PTFE/Silicone/PTFE (CTC-1557)	CP-1557	CP-1557A	CP-1557GS	CP-1557GSA	—
CHROM TECH VIAL ONLY (CTV), 100/PK					
N/A	CTV-4802	CTV-4802A	CTV-4802GS	CTV-4802GSA	CTH-1500

INSERTS FOR 15 x 45 mm VIALS		
	 Mandrel Point	
PART NO	CTI-8430	CTI-8430P
VOLUME	300 µL	300 µL
DESCRIPTION	Glass with bottom spring	PP with bottom spring

PRE-ASSEMBLED CLOSURES (CAP & SEPTA), 100/PK	
PART NO	DESCRIPTION
CTC-1554	Black cap with PTFE/Silicone
CTC-1557	Black cap with PTFE/Silicone/PTFE
CTC-1572	Black Top Hat with PTFE/Silicone Septa
CTC-1590	Top Seal Cap with 10 mil clear PP septa (all-in-one)
536013	Solid Storage Cap, PTFE/F217 lined

EMPTY CAP & SEPTA SOLD SEPARATELY, 100/PK	
PART NO	DESCRIPTION
408032	Empty Open Hole Cap, black (Septa not incl.)
408036	PTFE Seal (1,000/pk)
408045	PTFE/Silicone, 0.060"
408046	PTFE/Silicone, 0.075"
408047	PTFE/Silicone with slit, 0.060"



15 x 45 mm, 13mm Snap Seal Vials

- Use with 13 mm Snap Top Caps™ or 13 mm aluminum seals
- Designed to work in Waters WISP™ and Shimadzu 48 Position

	4 mL		4 mL W/GRADUATED MARKING		300 µL	2.5 mL
VIAL ONLY, 100/PK	CLEAR	AMBER	CLEAR	AMBER	GLASS/ PLASTIC*	PP
	CTV-1600	CTV-1600A	CTV-1600GS	CTV-1600GSA	CTV-5590	225250

*glass insert, clear plastic outside



868804

13 mm SNAP TOP CAPS		
PART NO	DESCRIPTION	QTY
242784	PTFE lined Snap Top Cap	100/pk
524013	Natural rubber/PTFE Snap Top Cap	100/pk
242778	Silicone/PTFE lined Snap Top Cap	100/pk
242774	PTFE/Silicone/PTFE lined Snap Top Cap	100/pk
528113	Silicone/PTFE w/starburst Snap Top Cap	100/pk
528013	PTFE/Silicone/PTFE w/starburst Snap Top Cap	100/pk

13 mm ALUMINUM CRIMP SEALS		
PART NO	DESCRIPTION	QTY
514013	Natural rubber/PTFE aluminum seal	100/pk
515013	Silicone/PTFE lined aluminum seal	100/pk

VIAL RACKS, 5/PK			
PART NO	DESCRIPTION	WELLS	WELL ID
868804	Fits 15 mm vials, 48 position	4 deep x 12 wide	15.5 mm

Glass Crimp Caps Headspace Vials (20 mm)

	20 mL		10 mL		6 mL
VIAL ONLY, 100/pk	CLEAR	AMBER	CLEAR	AMBER	CLEAR
Chrom Tech Flat Bottom	CTV-2375	CTV-2375A	CTV-2246	—	CTV-2238
Chrom Tech Round Bottom	CTV-2375R	—	CTV-2246R	—	—

Glass Screw Thread Vials for CombiPal Headspace (18 mm)

	20 mL		10 mL	
VIAL ONLY, 100/pk	CLEAR	AMBER	CLEAR	AMBER
Chrom Tech Round Bottom	CTV-2375T	CTV-2375AT	CTV-2346T	CTV-2346AT



Headspace Closures

20 mm CRIMP CLOSURES, 100/PK			
SEPTA	ALUMINUM SEALS	PRESSURE RELEASED LINED SEALS	MAGNETIC LINED SEALS
Cap w/PTFE/Silicone	408077	83320P	83320M
Cap w/PTFE/Butyl	408234	—	83220M
Cap Only, NO Septa	408101	—	—
Septa Only: PTFE/Butyl	408111	—	—
Septa Only: PTFE/Silicone	615020	—	—

CombiPAL 18 MM SCREW TOP CLOSURES, 100/PK	
SEPTA	MAGNETIC LINED SEALS
PTFE/Silicone	CTC-1852M



20 mm CRIMPERS & DECAPPERS	
PART NO	DESCRIPTION
AGILENT STANDARD ELECTRONIC CRIMPER & DECAPPER	
5190-3189	20 mm electronic crimper with lithium battery
5190-3191	20 mm electronic decapper with lithium battery
WHEATON MANUAL CRIMPER & DECAPPER	
W225303	20 mm manual EZ Crimper
W225353	20 mm manual EZ Decapper

5190-3191



868805



VIAL RACKS, 5/PK			
PART NO	DESCRIPTION	WELLS	WELL ID
868805	Fits 20 mm vials, 36 position	3 deep x 12 wide	23.1 mm

Storage Vials, Caps & Seals

SCREW CAP VIALS						
CLEAR	QTY	AMBER	QTY	VOLUME	DESCRIPTION	FITS CAPS
408213	100/pk	404810	100/pk	2 mL	12 x 32 mm	8-425
CTV-4802	100/pk	CTV-4802A	100/pk	4 mL	15 x 45 mm	13-425
224701	200/pk	224814	100/pk	8 mL	17 x 60 mm	15-425
402024	200/pk	402034	200/pk	12 mL	19 x 65 mm	15-425
224706	200/pk	CTV-2170	144/pk	16 mL	21 x 70 mm	18-400
224708	200/pk	—	—	24 mL	27 x 70 mm	20-400
402027	144/pk	402037	144/pk	40 mL	27 x 95 mm	24-400

EMPTY OPEN-TOP CAPS*			SEPTA, 100/PK		
PART NO	THREAD	QTY	FITS THREAD	PTFE/SILICONE	PTFE/RUBBER
408010	8-425	1,000/pk	8-425	400581	408246
408032	13-425	100/pk	13-425	408045	—
531015	15-425	100/pk	15-425	606515	240594
531018	18-400	100/pk	18-400	606518	—
412044	20-400	100/pk	20-400	615020	240596
531024	24-400	100/pk	24-400	615024	—

*Septa sold separately

SOLID TOP LINED CAPS			
PART NO	FITS CAPS	MATERIAL	QTY
536008	8-425	PTFE/F217	100/pk
410206-R	8-425	Rubber	1,000/pk
536009	9 mm	PTFE/F217	1,000/pk
536013	13-425	PTFE/F217	100/pk
410208-R	13-425	Rubber	200/pk
410208-T	13-425	PTFE	200/pk
410209-R	15-425	Rubber	200/pk
410209-T	15-425	PTFE	200/pk
410215-R	18-400	Rubber	500/pk
410215-T	18-400	PTFE	200/pk
410216-R	20-400	Rubber	500/pk
410216-T	20-400	PTFE	100/pk
410214-R	24-400	Rubber	500/pk
410214-T	24-400	PTFE	100/pk

 See Solvent Bottles (pg 266)

TECH TIP | What is F217?

F217 is a polyolefin foam extruded between two layers of polyethylene, usually 0.050" thick. F217 allows a closure to be torqued with 20 lbs of foot pressure and once the pressure is "backed off" the foam will come back to almost 100% of its original shape—giving a good, repeated seal.

V-Vial Reaction Vials

V-VIAL REACTION VIALS					
VOLUME	DIMENSION	THREAD	CLEAR	CLEAR GRADUATED	AMBER
100 µL	12 x 32 mm	8-425	402000	—	402009
300 µL	13 x 32 mm	13-425	402013	402014	402015
1 mL	13 x 45 mm	13-425	402001	402006	402010
3 mL	20 x 50 mm	20-400	402002	402007	—
5 mL	20 x 65 mm	20-400	402003	402008	402012



SPIN VANE		
PART NO	DESCRIPTION	QTY
412131	Spin Vane for 0.1-2mL micro vials	6/pk
402013-MS	Spin Vane for 3-5mL micro vials	6/pk



Vial Racks

VIAL RACKS, 5/PK			
DESCRIPTION	WELLS	WELL ID	PART NO
Fits 8 mm vials, 96 position	8 deep x 12 wide	9.5 mm	985750
Fits 12 mm vials, 50 position	5 deep x 10 wide	12.5 mm	985800
Fits 15 mm vials, 48 position	4 deep x 12 wide	15.5 mm	868804
Fits 15 mm vials, 90 position	6 deep x 15 wide	17.1 mm	868810
Fits 20 mm vials, 36 position	3 deep x 12 wide	23.1 mm	868805
50 position vial rack	5 deep x 10 wide	28.1 mm	868806
50 position vial rack	5 deep x 10 wide	30.0 mm	868808



Mininert™ Valves for Vials

Mininert push-button valves are highly dependable, leak-tight closures for screw-cap vials and other laboratory containers. When used with a glass vial, only PTFE and glass are in contact with the contents. Their unique features make Mininert valves the ideal closure for calibration standards, air- or moisture-sensitive fluids, derivatizing reagents, or volatile chemicals.

Operation is extremely simple - push the green button to open the valve, insert the needle through the septum and take a sample, withdraw the needle, and push the red button to close the valve.

- ➔ Leak-tight closure with syringe access
- ➔ For virtually any laboratory glassware



Mininert valves can be used at temperature up to 105 °F. However, after use at high temperatures, the valve may leak slightly when cooled to room temperature.

The sealing ability of Mininert valves is more than adequate for containing most volatile liquids and gases at low pressures. Mininert valves have been used as high as 120 PSI without leakage, but this is not a recommendation for pressurizing glass containers to these levels. Such pressurization of glass containers can be extremely dangerous.

MININERT™ VALVES FOR VIALS		
PART NO	THREAD	QTY
614158	13-425	12/pk
614160	15-425	12/pk
614161	18-400	12/pk
614170	20-400	12/pk
614163	24-400	12/pk
614250	20 mm crimp for 13mm ID* glassware	12/pk
644350	Replacement septa	50/pk
644850	Installation tool	ea

*The crimp-top valve for 13 mm ID glassware slides into the neck of the vial and features a threaded flange which is turned to provide a leak-tight fit.

EPA/VOA Vials

CLASS 1: (Standard) Containers are assembled with liner and closure, without washing treatment.

CLASS 2: (Pre-cleaned) Containers are processed according to E.P.A. recommended wash procedures - Washed with laboratory-grade biodegradable, non-phosphate detergent; Rinsed with ASTM Type I De-ionized water; Oven dried; and Assembled in a contaminate-free environment. The exterior of each case is labeled with a lot number. Each case contains a copy of wash "Standard Operating Procedure".

CLASS 3: (Certified) Containers are processed according to E.P.A. recommended wash procedures - Washed with laboratory-grade biodegradable, non-phosphate detergent; Rinsed with ASTM Type I De-ionized water; Oven dried; and Assembled in a contaminate-free environment. The exterior of each case is labeled with a lot number. Each case contains a "Certificate of Analysis". An independent laboratory is used to certify the container's cleanliness, assuring impartial results.



EPA/VOA VIALS, 72/PK				
VOLUME	DESCRIPTION	CLASS 1 PRE-ASSEMBLED	CLASS 2 PRE-CLEANED	CLASS 3 PRE-CLEANED/CERTIFIED
20mL	.125" PTFE/Sil, open top clear vial	CTV-1611	CTV-6212	CTV-6213
20mL	.125" PTFE/Sil open top amber vial	CTV-1621	CTV-6222	CTV-6223
20mL	w/Top Hat PTFE/Sil, clear vial	CTV-1631	CTV-6232	CTV-6233
20mL	w/Top Hat PTFE/Sil, amber vial	CTV-1641	CTV-6242	CTV-6243
20mL	PTFE lined, closed top clear vial	CTV-1651	CTV-6252	CTV-6253
20mL	PTFE lined, closed top amber vial	CTV-1661	CTV-6262	CTV-6263
40mL	.125" PTFE/Sil, open top clear vial	CTV-6411	CTV-6412	CTV-6413
40mL	.125" PTFE/Sil, open top amber vial	CTV-6421	CTV-6422	CTV-6423
40mL	w/Top Hat PTFE/Sil, clear vial	CTV-6431	CTV-6432	CTV-6433
40mL	w/Top Hat PTFE/Sil, amber vial	CTV-6441	CTV-6442	CTV-6443
40mL	PTFE lined, closed top clear vial	CTV-6451	CTV-6452	CTV-6453
40mL	PTFE lined, closed top amber vial	CTV-6461	CTV-6462	CTV-6463

TECH TIP

Looking for a vial you don't see listed?

- ➔ Bonded Cap
- ➔ Different Volume

For Example:

CTV-6613-BOND

60 mL clear vial, Bonded Cap, PTFE/Sil

Contact Chrom Tech
Support Desk
for recommendations—
support@chromtech.com

Shell Vials

SEPTA	1 mL, 8 x 40 mm				2 mL, 12 x 32 mm			4 mL, 15 x 45 mm		
	CLEAR	AMBER	PP	PP 700 µL	CLEAR	AMBER	PP	CLEAR	AMBER	PP
CONVENIENCE PACKS, 100/PK (SHELL VIAL AND PLUG)										
Conical Starburst Plug	CP-SV1	CP-SV1A	CP-SV1P	CP-SV07P	CP-SV2	CP-SV2A	CP-SV2P	CP-SV4	CP-SV4A	CP-SV4P
Flat Starburst Plug	CP-SV1F	—	—	CP-SV07FP	—	—	—	—	—	—
CHROM TECH SHELL VIAL ONLY, 100/PK (NO PLUG)										
N/A	SVC-8000	SVA-8000	SVP-8000	SVP-8007	SVC-1200	SVA-1200	SVP-1200	SVC-1500	SVA-1500	SVP-1500
CHROM TECH PLUGS ONLY, 100/PK (NO VIAL)										
Conical Starburst Plug	SB-8100				SB-1200			SB-1500		



SVP-8007

8 mm Crimp Vials & Closures

8 mm CRIMP VIALS & CLOSURES			
PART NO	TYPE	DESCRIPTION	QTY
CTV-0841	Vial	Vial, crimp top, clear, round bottom, 300 µL	500/pk
CTV-0844	Vial	Vial, crimp top, clear, tapered bottom, 200 µL	500/pk
404218	Crimp Cap w/Septa	Crimp cap with silicone rubber septum, PTFE coated	100/pk
408008	Crimp Cap w/Septa	Crimp cap with natural rubber septum, PTFE coated	100/pk
408009	Crimp Cap w/Septa	Red crimp cap with natural rubber septum, PTFE coated	100/pk
516008	Crimp Cap w/Septa	Crimp cap with PTFE/Silicone/PTFE	100/pk
CTC-0800	Snap Caps w/Septa	Polyethylene snap cap	1,000/cs
CTC-0806	Snap Caps w/Septa	Snap cap with natural rubber septum, PTFE coated	1,000/cs

CTV-0844



10-425 Screw Thread Vials & Closures

10-425 SCREW THREAD VIALS & CLOSURES			
PART NO	TYPE	DESCRIPTION	QTY
CTV-1002	Vial	Clear 2 mL vial, 10-425	100/pk
412091	Open hole cap	Screw cap, black, 10-425	100/pk
531010B	Open hole cap	Screw cap, Blue, 10-425	100/pk
405392	Septa	PTFE/Silicone septa	100/pk
309010	Septa	Black Viton septa, 0.030"	100/pk

TECH TIP

We recommend the 9 mm screw thread vials over the 10-425 for autosampler compatibility.



See 9 mm Vials (pg 9)

Silane Treated Autosampler Vials

SILANE TREATED AUTOSAMPLER VIALS, 100/PK		
PART NO	VOLUME	DESCRIPTION
12 x 32 mm VIALS		
CTV-7272	2mL	Clear, PTFE/Silicone, 8-425 screw cap
CTV-7282	2mL	Amber, PTFE/Silicone, 8-425 screw cap
CTV-7292	2mL	Clear, Snap seal, PTFE/Silicone Snap Top Cap
CTV-7202	2mL	Amber, Snap seal, PTFE/Silicone Snap Top Cap
15 x 45 mm VIALS		
CTV-7472	4mL	Clear, PTFE/Silicone, 13-425 screw cap
CTV-7482	4mL	Amber, PTFE/Silicone, 13-425 screw cap
CTV-7492	4mL	Clear, Snap seal vial, PTFE/Silicone Snap Top Cap
CTV-7402	4mL	Amber, Snap seal, PTFE/Silicone Snap Top Cap

TECH TIP

Looking for a vial you don't see listed? Any vial can be silane treated.



Contact Chrom Tech
Support Desk
for a quote—
support@chromtech.com

RSA Low Adsorption Vials

Is your data at risk due to the reactivity of your autosampler vial?

Are you concerned with basic and polar analytes adsorbing to your glass vials?

...Try the **MicroSolv Reduced Surface Activity Glass Autosampler Vials** –
Now Available through Chrom Tech!

- ➔ Detect low abundance analytes normally adsorbed by glass
- ➔ Limits pH changes in vials before injection even hours later
- ➔ Prevents sample hydrolysis that can occur in your vials—
RSA glass has virtually no metals compared to MS Certified Glass Vials
- ➔ No meniscus when water is used as the main solvent
- ➔ Not Coated or Silanized
- ➔ Upgrade from your MS Certified Vial to the Reduced Surface Activity Vials



Not Coated







TECH TIP




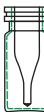
Who should use RSA Vials?

- Pharmaceutical Labs: Low dosage Pharma or Generics
- Environmental Labs: Low abundance analyte concentrations
- LCMS Users
- Regulated Customers

RSA™ Glass Wide Mouth Screw Thread Vials & Closures (9 mm)

						
	2 mL W/GRADUATED MARKING		1.5 mL RECOVERY	1.2 mL MAX RECOVERY MRQ™	300 µL W/ FUSED INSERT	PRE-ASSEMBLED CLOSURE
SEPTA	CLEAR	AMBER	CLEAR	CLEAR	CLEAR	CAP & SEPTA
CONVENIENCE PACK (CP) INCLUDES VIAL & STANDARD PRE-ASSEMBLED CAP & SEPTA, 100/PK						
PTFE/Silicone (CTC-0952-AQ)	CP-0952GS-RS	CP-0952GSA-RS	CPH-0952-RS	CPD-0952-RS	CP-0952-03-RS	CTC-0952-AQ
PTFE/Silicone w/Slit (CTC-0955-AQ)	CP-0955GS-RS	CP-0955GSA-RS	CPH-0955-RS	CPD-0955-RS	CP-0955-03-RS	CTC-0955-AQ
VIAL ONLY (CTV), 100/PK						
N/A	CTV-1209GS-RS	CTV-1209GSA-RS	CTH-0900-RS	CTD-0900-RS	CTV-0930-RS	—

RSA™ Glass Snap/Crimp Seal Vials & Closures

						
	2 mL W/GRADUATED MARKING		1.5 mL RECOVERY	1.2 mL MAX RECOVERY MRQ™	300 µL W/ FUSED INSERT	PRE-ASSEMBLED CLOSURE
SEPTA	CLEAR	AMBER	CLEAR	CLEAR	CLEAR	CAP & SEPTA
CONVENIENCE PACK (CP) INCLUDES VIAL & STANDARD PRE-ASSEMBLED CAP & SEPTA, 100/PK						
PTFE/Silicone (CTC-1305B-MS)	CP-1805GS-RS	CP-1805GSA-RS	CPH-1805-RS	CPD-1805-RS	CP-1805-03-RS	CTC-1305B-MS
PTFE/Silicone w/Slit (CTC-1370B-MS)	CP-1870GS-RS	CP-1870GSA-RS	CPH-1870-RS	CPD-1870-RS	CP-1870-03-RS	CTC-1370B-MS
VIAL ONLY (CTV), 100/PK						
N/A	CTV-1800GS-RS	CTV-1800GSA-RS	CTH-1800-RS	CTD-1800-RS	CTV-1830-RS	—

Agilent Screw Top Vials & Closures

AGILENT 2 mL WIDE OPENING SCREW TOP GLASS VIALS			
DESCRIPTION	CERTIFIED	100/PK	1,000/CS*
Clear	●	5182-0714	5183-2067
Clear, write-on spot	●	5182-0715	5183-2068
Amber	●	5188-6535	5188-6536
Amber, write-on spot	●	5182-0716	5183-2069
DEACTIVATED VIALS			
Clear	●	5183-2070	—
Clear, write-on spot	●	5183-2071	—
Amber, write-on spot	●	5183-2072	—
AGILENT WIDE OPENING SCREW TOP LIMITED VOLUME VIALS			
250 µL vial, polypropylene	●	5190-2242	5190-2243
250 µL vl, polypropylene w/glass insert, screw top		5188-5390	—

*Case includes 10 packs of 100 vials

AGILENT SCREW CAPS FOR 2 ML VIALS					
COLOR	SEPTA TYPE	CERTIFIED	100/PK	500/PK	1000/PK
Blue	PTFE/red silicone septa	●	5182-0717	5185-5820	5190-1599
	PTFE/silicone/PTFE septa	●	5182-0723	5185-5862	—
	Pre-slit PTFE/silicone septa	●	5183-2076	5185-5865	—
	PTFE-lined solid top	●	5183-2075	—	—
	Bonded PTFE/silicone septa		5185-5823	—	—
	Bonded pre-slit PTFE/silicone septa		5185-5824	5040-4649	—
Green	PTFE/red silicone septa	●	5182-0718	5185-5829	—
	PTFE/silicone/PTFE septa	●	5182-0724	5185-5861	—
	Pre-slit PTFE/silicone septa	●	5183-2077	—	—
Red	PTFE/red silicone septa	●	5182-0719	—	—
	PTFE/silicone/PTFE septa	●	5182-0725	—	—
	Pre-slit PTFE/silicone septa	●	5183-2078	—	—

AGILENT VIAL RACK		
DESCRIPTION	QTY	PART NO
Vial rack, plastic for 12 mm crimp top microvials	5/pk	9301-0722

AGILENT LC VIALS AND CLOSURES		
DESCRIPTION	QTY	PART NO
6 mL SCREW TOP VIALS AND CLOSURES		
Clear, flat bottom	100/pk	9301-1377
Screw caps, 16 mm	100/pk	9301-1379
PTFE/silicone septa	100/pk	9301-1378
PTFE/silicone septa, pre-slit	100/pk	5188-2758
5 mL SCREW TOP VIALS		
Clear, high recovery	30/pk	5188-5369

AGILENT WASH VIALS (also for standards, diluents) FOR AGILENT GC AUTOINJECTOR		
DESCRIPTION	QTY	PART NO
4 mL wash vials with fill markings and caps	25/pk	5182-0551
Diffusion caps for 4 mL vials	12/pk	07673-40180



TECH TIP | Agilent Certified

Only Agilent Certified Vials are shipped with a certificate confirming that they are:

- ➔ Produced in an ISO 9001 certified environment
- ➔ Manufactured and packaged to reduce contamination, which can cause ghost peaks
- ➔ Pierce tested with Agilent needles and syringes
- ➔ Inspected with automated vision systems
- ➔ Compatible with the autosampler's gripping and injection mechanisms



Agilent Certified Inserts for Wide Opening Screw and Crimp Top Vials

AGILENT CERTIFIED MICROVOLUME INSERTS FOR WIDE OPENING SCREW & CRIMP TOP VIALS				
DESCRIPTION	MAXIMUM FILL VOLUME	RECOMMENDED FILL VOLUME	QTY	PART NO
CONICAL INSERTS WITH POLYMER FEET & MANDREL INTERIOR				
Glass inserts	350 µL	250 µL	100/pk	5181-1270*
Deactivated glass inserts	320 µL	250 µL	100/pk	5181-8872
CONICAL GLASS INSERTS				
Pulled-point glass inserts	350 µL	250 µL	100/pk	5183-2085
FLAT BOTTOM INSERTS				
Glass flat bottom inserts	440 µL	400 µL	500/pk	5181-3377
Deactivated glass flat bottom inserts	440 µL	400 µL	500/pk	5183-2086

*For vortexing or mixing small volume samples, Agilent recommends using 5181-1270 because it provides a secure seal with the cap and septum



Agilent Crimp Top Vials & Closures

AGILENT 2 mL WIDE OPENING CRIMP TOP GLASS VIALS			
DESCRIPTION	CERTIFIED	100/PK	1,000/CS*
Clear	●	5181-3375	5183-4491
Clear, write-on spot	●	5182-0543	5183-4492
Amber, write-on spot	●	5181-3376	5183-4493
DEACTIVATED VIALS			
Clear	●	5183-4494	—
Clear, write-on spot	●	5183-4495	—
Amber, write-on spot	●	5183-4496	—
CRIMP TOP VIALS WITH FIXED INSERTS			
Amber, 300 µL recommended useable volume		5188-6572	—
Clear, 300 µL recommended useable volume		9301-1388	—
AGILENT WIDE OPENING CRIMP TOP LIMITED VOLUME VIALS			
250 µL vial, polypropylene	●	5188-2788	9301-0978
250 µL vial, polypropylene	—	—	5190-3155
1 mL vial, polypropylene	—	5182-0567	—
250 µL vial, polypropylene w/glass insert	—	9301-0977	—

*Case includes 10 packs of 100 vials

AGILENT CRIMP CAPS WITH 11 MM SEPTA						
CAP COLOR	SEPTA TYPE	CERTIFIED	25/PK	100/PK	500/PK	1,000/PK
Silver aluminum	PTFE/silicone/PTFE septa	●	—	5181-1211	—	5183-4499
	PTFE/silicone septa	●	—	5182-0552	—	5183-4500
	Black Viton septa	●	—	5181-1212	—	—
	Thin PTFE septa	●	—	5182-0871	—	—
	PTFE/red rubber septa	—	—	5181-1210	5061-3370	5183-4498
Blue aluminum	PTFE/red rubber septa	—	—	5181-1215	—	—
Green aluminum	PTFE/red rubber septa	—	—	5181-1216	—	—
Red aluminum	PTFE/red rubber septa	—	—	5181-1217	—	—
Gold aluminum	Magnetic	—	—	5188-5386	—	—

AGILENT 6 mL CRIMP TOP LC VIALS & CLOSURES		
DESCRIPTION	QTY	PART NO
Clear, flat bottom	100/pk	9301-1419
Crimp caps, 20 mm, PTFE/silicone septa	100/pk	9301-1425



Agilent Headspace Vials & Closures

AGILENT CERTIFIED HEADSPACE CRIMP TOP GLASS VIALS			
DESCRIPTION	QTY	FLAT BOTTOM	ROUNDED BOTTOM
10 mL, 23 x 46 mm			
Clear	100/pk	5182-0838	5183-4475
Amber	100/pk	5067-0227	5190-2238
Clear, graduation marks and write-on spot	100/pk	5190-2285	—
Amber, graduation marks and write-on spot	100/pk	5190-2287	—
20 mL, 23 x 75 mm			
Clear	100/pk	5182-0837	5183-4474
Amber	100/pk	5067-0226	5190-2239
Clear, graduation marks and write-on spot	100/pk	5190-2286	—
Amber, graduation marks and write-on spot	100/pk	5190-2288	—

AGILENT 20 mm HEADSPACE CRIMP CAPS AND SEPTA					
CAP COLOR	SEPTA TYPE	SPECIFICATIONS	CERTIFIED	100/PK	10,000/PK
Silver aluminum	PTFE/silicone septa	-60 °C to 180 °C	●	5183-4477	5190-2257
Silver aluminum w/safety feature	PTFE/silicone septa	-60 °C to 180 °C	●	5183-4478	—
Silver aluminum	Molded PTFE/butyl septa	-40 °C 125 °C	●	5183-4479	5190-2258
Silver aluminum w/safety feature	Molded PTFE/butyl septa	-40 °C 125 °C	●	5183-4480	—
Silver aluminum	No septa			9301-0721	—
Silver aluminum w/safety feature	No septa			9301-0718	—
Septa only	Gray PTFE/black butyl molded	-40 °C 125 °C		9301-0976	—
Septa only	Tan PTFE/white silicone	-60 °C to 180 °C		9301-0719	5067-0234

AGILENT COMBIPAL HEADSPACE SCREW TOP VIALS	
DESCRIPTION	100/PK
Clear, 10 mL, 23 x 46 mm, 18 mm thread	5188-5392
Amber, 10 mL, 23 x 46 mm, 18 mm thread	5188-6538
Clear, 20 mL, 23 x 75 mm, 18 mm thread	5188-2753
Amber, 20 mL, 23 x 75 mm, 18 mm thread	5188-6537

AGILENT COMBIPAL 18 mm SCREW TOP CAPS W/ SEPTA		
CAP COLOR	SEPTA TYPE	100/PK
Silver aluminum, magnetic	PTFE/silicone septa (top white, bottom blue)	5188-2759
Steel, certified	High temperature septa	5190-3986



Agilent Solvent Reservoirs

AGILENT SOLVENT RESERVOIRS	
PART NO	DESCRIPTION
9301-6342	2 L reservoir, clear
9301-6341	2 L reservoir, amber



NEW! ERGONOMIC SOLVENT RESERVOIRS	
PART NO	DESCRIPTION
9301-6527	125 mL reservoir, clear
9301-6523	500 mL reservoir, clear, with cap
9301-6525	500 mL reservoir, amber, with cap
9301-6524	1 L reservoir, clear
9301-6528	1 L reservoir, clear, with cap
9301-6526	1 L reservoir, amber



The new bottles feature an ergonomic design with a slimmer profile and ergonomically shaped gripping zones on both sides of the bottle, promoting easier and safer usage.

Agilent Crimpers and Decappers

- ➔ More vials crimped per charge—new lithium ion battery lasts three times longer
- ➔ Less hand strain—lighter weight means less effort
- ➔ Improved power signal—clearly shows when battery needs recharging
- ➔ Easily used in right or left hand—display on top for easier viewing

Adjustable, slim steel jaws fit around closely spaced vials, enabling you to crimp vials directly in crowded autosampler trays.

AGILENT CRIMPERS & DECAPPERS	
PART NO	DESCRIPTION
STANDARD ELECTRONIC CRIMPERS & DECAPPERS	
5190-3188	11 mm electronic crimper with lithium battery
5190-3189	20 mm electronic crimper with lithium battery
5190-3190	11 mm electronic decapper with lithium battery
5190-3191	20 mm electronic decapper with lithium battery
5190-3192	Replacement lithium battery for standard crimper and decapper
HIGH POWER ELECTRONIC CRIMPERS & DECAPPERS	
5190-4061	High power electronic crimping tool with power supply
5190-4062	11 mm Crimper jaw set, high power
5190-4064	20 mm Crimper jaw set, high power
5190-4063	11 mm Decapper jaw set, high power
5190-4065	20 mm Decapper jaw set, high power
5190-4067	20 mm High power crimping tool and jaw set bundle
ACCESSORIES	
5190-4066	Base for electronic crimper



TECH TIP

High Power Electronic Crimper
For high temperature applications up to 300 °C, steel caps with high performance septa are recommended—the high power crimper is ideal for these more rigid caps as more force is required to form the crimp.

Wheaton Crimpers and Decappers

- ➔ Lightweight and ergonomic design with tapered jaw for easier vial access
- ➔ Adjustable stop—Adjust the tightness of the seal while ensuring consistent crimping

WHEATON CRIMPERS & DECAPPERS		
DESCRIPTION	EZ CRIMPER	EZ DECAPPER
8 mm seals	W225300	W225350
11 mm seals	W225301	W225351
13 mm seals	W225302	W225352
20 mm seals	W225303	W225353



Vial Racks

VIAL RACKS, 5/PK			
PART NO	DESCRIPTION	WELLS	WELL ID
985750	Fits 8 mm vials, 96 position	8 deep x 12 wide	9.5 mm
985800	Fits 12 mm vials, 50 position	5 deep x 10 wide	12.5 mm
868804	Fits 15 mm vials, 48 position	4 deep x 12 wide	15.5 mm
868810	Fits 15 mm vials, 90 position	6 deep x 15 wide	17.1 mm
868805	Fits 20 mm vials, 36 position	3 deep x 12 wide	23.1 mm
868806	50 position vial rack	5 deep x 10 wide	28.1 mm
868808	50 position vial rack	5 deep x 10 wide	30.0 mm

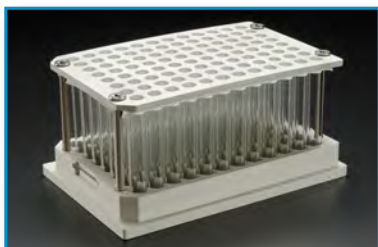


Well Plates & Accessories

Plates	24
96-Well Multi-Tier™ Micro Plate System (Patented)	24
Replacement Vials for Multi-Tier & Aluminum Plate Systems	25
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Featured Products

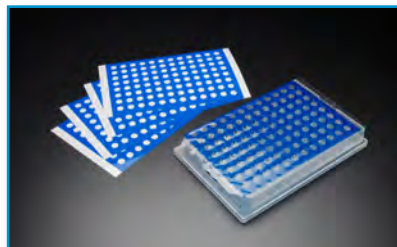
24 Aluminum 96-Well Micro Plate System (Patented)



27 Chrom Tech MS Polypropylene Plates

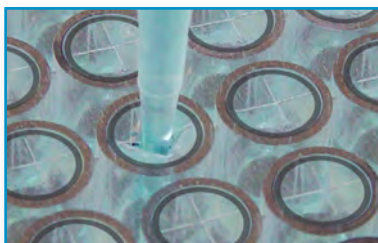


28 PTFE Sealing Films



PTFE sealing film has an adhesive free area around each well so plastic pipette tips and metal probes stay clean.

29 X-Pierce™ Precut Pierceable Sealing Films



Special hairline X-cuts and thin adhesive prevent fouling or occlusion of probes and tips.

29 Plate Heat Sealers & Foils

Heat Seals and Foils to be used with raised rim plates and Porvair MiniSeal II.



30 MiniSeal II Semi-Automatic Plate Heat Sealer

MiniSeal II, Semi-automatic heat applied plate sealing system. For use with thermal seals and raised rim plates.



31 Porvair Evaporators



Each method has up to five timed stages which control: gas temperature, gas flow rate, and needle depth
Built-in duct adapter for fume management

Notes from the Support Desk

AntiBIND™ Microplates

AntiBIND™ Microplates utilize a new technology that modifies the polypropylene surface at the molecular level to produce a comprehensive hydrophilic surface that eliminates nonspecific protein binding.

96AB-500-20/40



NEW!

96-Well Multi-Tier™ Micro Plate System (Patented)

- ➔ Standard 8 x 12 (96 well) footprint with an alphanumeric grid
- ➔ Compatible with autosampler and robotic systems
- ➔ Spacers build adjustable height to support different sized vials
- ➔ PTFE/Silicone/PTFE liner provides sample integrity
- ➔ Base plate has an open bottom to facilitate uniform heating/cooling of the vials
- ➔ Secure fit of the vials in the base plate permit use with shaker and vortex mixers during sample preparations



Plates manufactured in Topas (COC—Cyclic Olefin Copolymers) have excellent clarity and heat/chemical resistance. The plates can be autoclaved and sterilized.

Complete MTP system includes:

- ➔ 96-Well Base Plate
- ➔ Choice of 4 Vial Sizes: 0.5 mL, 1.0 mL, 1.5 mL, 2.0 mL — Conical or Flat Bottom
- ➔ Spacer for 1.0 mL, 1.5 mL and 2.0 mL Vials
- ➔ Cover
- ➔ PTFE/Silicone/PTFE Liner



MULTI-TIER™ MICRO PLATE SYSTEM (TOPAS)		
PART NO	DESCRIPTION	QTY
96M-0450T	0.5 mL Topas Plate System with Glass Conical Vials	1 Plate
96M-04100T	1.0 mL Topas Plate System with Glass Conical Vials	1 Plate
96M-04150T	1.5 mL Topas Plate System with Glass Conical Vials	1 Plate
96M-04200T	2.0 mL Topas Plate System with Glass Conical Vials	1 Plate
96M-0450PT	0.5 mL Topas Plate System with Polypropylene Conical Vials	1 Plate
96M-04100PT	1.0 mL Topas Plate System with Polypropylene Conical Vials	1 Plate
96M-04150PT	1.5 mL Topas Plate System with Polypropylene Conical Vials	1 Plate
96M-04200PT	2.0 mL Topas Plate System with Polypropylene Conical Vials	1 Plate
96M-0450FT	0.5 mL Topas Plate System with Glass Flat Bottom Vials	1 Plate
96M-04100FT	1.0 mL Topas Plate System with Glass Flat Bottom Vials	1 Plate
96M-04150FT	1.5 mL Topas Plate System with Glass Flat Bottom Vials	1 Plate
96M-04200FT	2.0 mL Topas Plate System with Glass Flat Bottom Vials	1 Plate

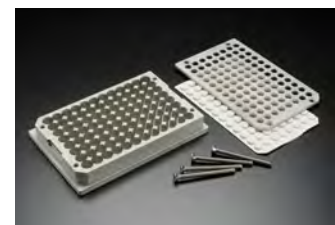
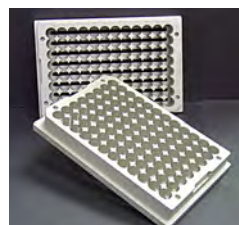
*Assembled Micro Plates are available with any combination of vials and liners. Please contact Chrom Tech for more information.

Aluminum 96-Well Micro Plate System (Patented)

- ➔ Use of aluminum promotes efficient heat transfer
- ➔ Reusable anodized aluminum metal plate prevents finger print smudges and discoloration to allow years of use

SOLID ALUMINUM BASE PLATE SYSTEM*			
PART NO	DESCRIPTION	TYPE	QTY
96AL-12	Solid Aluminum, 96-Well Base Plate w/Tapped Holes in each corner	Base	1 Plate
96AL-14	Vented Aluminum, 96-Well Base Plate w/Tapped Holes in each corner	Base	1 Plate
96AL-10	Aluminum Cover for Base Plate	Cover	1 Piece
96-05SC	Stainless Steel Screws for 0.5 mL Aluminum 96-Well Base Plate	Screws	4 Pieces
96-10SC	Stainless Steel Screws for 1.0 mL Aluminum 96-Well Base Plate	Screws	4 Pieces
96-15SC	Stainless Steel Screws for 1.5 mL Aluminum 96-Well Base Plate	Screws	4 Pieces
96-20SC	Stainless Steel Screws for 2.0 mL Aluminum 96-Well Base Plate	Screws	4 Pieces

*Assembled Solid Aluminum Base Plate Systems are available — please contact Chrom Tech for more information
Cover required to keep inserts in place



Assemble your own 96-Well Multi-Tier™ Micro Plate System

- ➔ **0.5 mL System**— Requires Base Plate Only
- ➔ **1.0 mL System**— Requires one Spacer and Base Plate
- ➔ **1.5 mL System**— Requires two Spacers and Base Plate
- ➔ **2.0 mL System**— Requires three Spacers and Base Plate

REPLACEMENT ACCESSORIES FOR 96-WELL MULTI-TIER™ MICRO PLATE SYSTEM

PART NO	DESCRIPTION	QTY
96M-10T	Cover for Plate System — Topas Material	5 Pieces
96M-11T	Spacer for Plate System — Topas Material	1 Piece
96M-12T	96-Well Base Plate — Topas Material	1 Piece



TECH TIP

Many assays require heating or cooling of the vials to simulate in vitro conditions or for temperature sensitive experiments. The heating or cooling is usually done with liquids or gases. The bottom design allows our base plate to be immersed in heating or cooling fluids to allow total fluid contact with the vials. This permits a uniform transfer of energy to and from the vials. Our plates do not float in the bath. They are constructed of chemically resistant Topas (COC—Cyclic Olefin Copolymers) material.

Consumables and Replacement Components for Multi-Tier and Aluminum Plate Systems

- ➔ Choose your own vials and liners

GLASS VIALS IN VIAL LOADER

PART NO	INSERT VOLUME	INSERT BOTTOM SHAPE	QTY
96I-0450	0.5 mL	Conical Bottom	96 in vial loader
96I-04100	1.0 mL	Conical Bottom	96 in vial loader
96I-04150	1.5 mL	Conical Bottom	96 in vial loader
96I-04200	2.0 mL	Conical Bottom	96 in vial loader
96I-0450F	0.5 mL	Flat Bottom	96 in vial loader
96I-04100F	1.0 mL	Flat Bottom	96 in vial loader
96I-04150F	1.5 mL	Flat Bottom	96 in vial loader
96I-04200F	2.0 mL	Flat Bottom	96 in vial loader
96I-04150R	1.5 mL	Round Bottom	96 in vial loader
96I-04200R	2.0 mL	Round Bottom	96 in vial loader

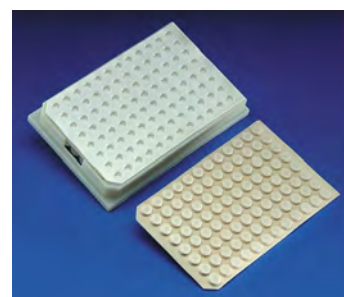


To use the Vial Loader:

1. Peel away the packaging and place an empty Base Plate on top of the vial loader.
2. Invert the entire unit, the plate is ready to use.

MOLDED 96 PLUG LINER

PART NO	DESCRIPTION	QTY
96M-16	Molded PTFE/Silicone Liner, 96 Plugs	5/pk
96M-26	Prescored Molded PTFE/Silicone Liner, 96 Plugs	5/pk
96M-17	Molded Silicone Liner, 96 Plugs	5/pk
96M-27	Prescored Molded Silicone Liner, 96 Plugs	5/pk



Liner locks into the vials to create an inert sample environment

96-Well Plate with Glass Inserts Designed for High Throughput Chromatography

- ➔ Glass inserts provide an inert solvent resistant environment for samples
- ➔ Assembled plate has excellent thermal stability
- ➔ Pierceable cap mat is designed to seal crimp top or flanged inserts, ensuring sample integrity
- ➔ Cap mat assembles easily with the inserts in the plate—no need for machines to seal the plate
- ➔ Compatible with autosamplers and robotic systems



96F-0350

Glass inserts loaded in the 96-well plate performs similar to standard 12x32 mm vials for chromatography testing. The 96-well pierceable cap mat is lined with the same PTFE/Silicone septa used in closures for chromatography.

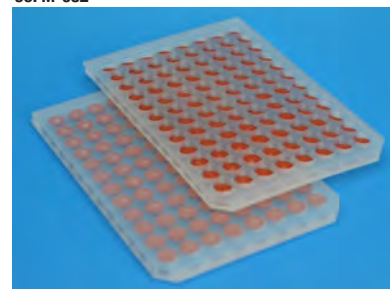
96FI-0350VL



96-WELL POLYPROPYLENE PLATE AND GLASS INSERTS		
PART NO	DESCRIPTION	QTY
96F-0350	96-Well Polypropylene Plate Assembled with 350µL Glass Conical Pulled Point Inserts with Flange	ea
96FI-0350	350 µL Glass Conical Pulled Point Insert with Flange, 6x32 mm, in Vial Loader	96/pk

PIERCEABLE CAP MAT PTFE/SILICONE LINED		
PART NO	DESCRIPTION	QTY
96FM-052	96-Well Pierceable Cap Mat, Clear PTFE/Orange Silicone Lined, for Crimp Top or Flanged Inserts in MicroPlates	ea
96FM-055	96-Well Pierceable Cap Mat, Clear PTFE/Orange Silicone Lined with Slit, for Crimp Top or Flanged Inserts in MicroPlates	ea

96FM-052



Reservoir Trough Polypropylene Plates

RESERVOIR TROUGH PLATES, POLYPROPYLENE			
PART NO	DESCRIPTION	PLATE HEIGHT	QTY
201244-100	300 mL Single cavity reservoir, 96 pyramid base	44 mm	25/cs
201254-100	86 mL Single cavity reservoir, 96 pyramid base	19 mm	25/cs
201256-100	252 mL max, 12 column reservoir (21 mL/column), pyramid base	44 mm	25/cs
201312-100	292 mL max, 4 column reservoir (73 mL/column), pyramid base	44 mm	25/cs
CTL-9600	Universal clear polystyrene plate lid	44 mm	25/cs

AntiBIND™ Microplates

AntiBIND™ Microplates utilize a new technology that modifies the polypropylene surface at the molecular level to produce a comprehensive hydrophilic surface that eliminates nonspecific protein binding. The treatment employs the use of Advanced Plasma Treatment (APT) technology to provide a comprehensive treatment without using any interfering leachables or additives that would migrate into solution during chromatography applications or long term storage. This results in increased protein recovery at low concentrations and more accurate and repeatable results.

ANTIBIND MICROPLATES				
20/CS	40/CS	WELL FORMAT	WELL, BASE DESIGN	WELL VOLUME
96AB-500-20	96AB-500-40	96 Well Microplate	Round, U	500 µL
384AB-120-20	384AB-120-40	384 Well Microplate	Round, U	120 µL

96AB-500-20/40



384AB-120-20/40

These microplates can be used in chromatography applications, long term sample storage, and bioanalytical assays. AntiBIND™ Microplates increase protein recovery at low concentrations which lead to more accurate and repeatable results.

Plate+™ Glass Coated Microplates

- Plate+ provides microplates with a chemical resistance similar to glass while retaining the advantages of polypropylene
- Eliminates the need to use glass limited volume inserts with plastic microplates
- Plate+ is chemically and thermally resistant, will tolerate temps from -80° C to 80° C

PLATE+ GLASS COATED MICROPLATES				
10/PK	100/CS	WELL FORMAT	WELL, BASE DESIGN	WELL VOLUME
96GC-P302	96GC-P303	96 Well Microplate	Round, V	220 µL
96GC-P300	96GC-P301	96 Well Microplate	Round, U	300 µL
96GC-P304	96GC-P305	96 Well Microplate	Round, Flat	370 µL
96GC-P306	96GC-P307	96 Well Microplate	Round, U	1.2 mL
96GC-P308	96GC-P309	96 Well Microplate	Square, Flat	2.4 mL

96GC-P302



Polypropylene plates coated with a 200 nm thick layer of silicone dioxide

Chrom Tech MS Polypropylene Plates

- Virgin Polypropylene
- Tested for Low Extractables

Chrom Tech's mass spec plates are manufactured with virgin polypropylene and tested for low extractables. Other plates may have molding-aid chemicals which can leach into the analytical sample.

CHROM TECH MS 96 WELL POLYPROPYLENE, RAISED RIM PLATES*		
PART NO	DESCRIPTION	QTY
96-6009	2 mL Square Well, Pyramid bottom	50/cs
96-6001	1 mL Round Well, Round bottom, rimmed	50/cs
96-6001NR	1 mL Round Well, Round bottom, not rimmed	50/cs
96-6002	2 mL Round Well, Round bottom	50/cs

*Raised rim plates can be used with thermal heat seals.

96-6009



Polypropylene Plates

96 WELL POLYPROPYLENE, NO RIM, FLAT		
PART NO	DESCRIPTION	QTY
96-850356	2 mL Square Well, Round bottom	20/cs
96-0001	1 mL Round Well, Round bottom	20/cs

Friction Seals, Pierceable Cap Mats

FRICTION SEALS, PIERCEABLE CAP MATS		
PART NO	DESCRIPTION	QTY
96-0662	Pierceable cap mat for 2mL square	50/pk
96M-03	96 Round Sealing Silicone Mat, 7mm	10/pk

96-0662



96M-03



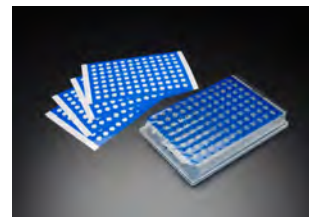
96-Well Pattern Sealing Film and Tape

96-Well Pattern Blue PTFE Sealing Film (Patented)

- Solvent-free adhesives adhere to polypropylene, polystyrene and polycarbonate materials
- PTFE film is compatible with aqueous solutions and organic solvents
- Excellent chemical resistance, resistant to DMSO
- Functional temperature range: -80 °C to 120 °C
- Clear zone above each well is free of adhesive and easily pierceable

96-WELL PATTERN BLUE PTFE SEALING FILM (PATENTED)

PART NO	DESCRIPTION	QTY
BST-9790	2 mil Blue PTFE 96-Well Pattern Film	100/pk
BST-9791	5 mil Blue PTFE 96-Well Pattern Film	100/pk



PTFE sealing film has an adhesive free area around each well so plastic pipette tips and metal probes stay clean.

TECH TIP

BST-9790 is the recommended sealing film for trouble-free high-throughput applications.

96-Well Adhesive Free Zone Sealing Film (Patent Pending)

- Clear zones and end tabs facilitate well alignment and accurate positioning
- Inert and chemically resistant
- Functional temperature range -40 °C to 90 °C
- Clear zone above each well is free of adhesive and easily pierceable

With a 70 µm polyethylene top layer and inert white polypropylene and acrylic adhesive sublayer, this easy-piercing sealing film allows direct sample recovery with single or multichannel pipettors and robotic probes.

96-WELL ADHESIVE FREE ZONE SEALING FILM (PATENT PENDING)

PART NO	DESCRIPTION	QTY
ZAF-PE-50	Adhesive Free Zone Sealing Film	50/pk



The adhesive-free zone above each well prevents adhesive fouling of the pipet tip or probe, ultimately minimizing the amount of adhesive that comes into contact with the sample.

EZ-Pierce™ Sealing Films

- Easily pierceable with pipet tips or robotic probes
- Functional temperature range -40 °C to 90 °C
- Economic sealing film, adhesive covers wells

Easily pierceable, 70 µm thick, polyethylene with acrylic adhesive, EZ-Pierce™ sealing films allow direct sample recovery with single or multichannel pipettors and robotic probes.

EZ-PIERCE SEALING FILMS

PART NO	DESCRIPTION	QTY
EZP-NL	EZ-Pierce Film	100/cs

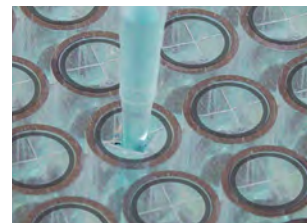


EZ-Pierce Sealing Films

X-Pierce™ Precut Pierceable Sealing Films for Automation

- ➔ Protect samples and limit evaporation, short term
- ➔ Special hairline X-cuts and thin adhesive prevent fouling or occlusion of probes and tips
- ➔ Functional temperature range -40 °C to 90 °C
- ➔ Sealing film reseals for continued sample protection after sampling

Also useful for protecting contents of plate from contamination during multiple manual reagent additions over time. X-Pierce™ sealing films are 89 µm thick vinyl with an 18 µm thick adhesive layer, designed for temporary protection from contamination and evaporation for samples in 96-well plates. A precut "X" over each well creates four flaps that easily bend downward when pushed by a robotic probe or pipet tip, allowing sample access without coring or adhesive fouling. A thin adhesive layer and special hairline cuts separating the X-Pierce flaps combine to prevent probes from contacting adhesive and becoming occluded. The flaps return to their original position after sampling for continued protection. For long-term sample protection after sampling, a continuous sealing film should be applied as a second layer.



X-Pierce Sealing Films

X-PIECE PRECUT PIERCEABLE SEALING FILMS

PART NO	DESCRIPTION	QTY
XP-100	X-Pierce Sealing Films, non-sterile	100/pk

Porvair Heat Seals and Foils

All Porvair heat seals have a sealing integrity range of -80° C to 120° C, are resistant to DMSO and TFA as well as most other solvents and will seal Polypropylene plates. For Polystyrene plates, please only use Clear Seal - 5000090. Heat Seals and Foils to be used with raised rim plates and Porvair MiniSeal II.

PORVAIR COLOR-CODED THERMAL SEALS

PART NO	DESCRIPTION	QTY
229571	Peelable 70 µm polyester/aluminum laminate sealing foil—color coded red 125 mm x 78 mm sheets printed with color coding and right side up for ease of use	100/pk
229572	Easily pierced 20 µm PP/PS lacquered aluminum foil—color coded green 125 mm x 78 mm sheets printed with color coding and right side up for ease of use	100/pk
229573	Pierceable/peelable 38 µm lacquered aluminum foil—color coded blue 125 mm x 78 mm sheets printed with color coding and right side up for ease of use	100/pk
229574	Strong 85 µm thick aluminum foil for long term storage—color coded black 125 mm x 78 mm sheets printed with black coding and right side up for ease of use	100/pk
5000090	Sealing film optically clear 75 µm—non peelable, but pierceable 125 mm x 78 mm sheets printed with black coding and right side up for ease of use	100/pk
500010	Sealing film optically clear 105 µm—peelable, but not pierceable 125 mm x 78 mm sheets printed with black coding and right side up for ease of use	100/pk

PORVAIR MINISEAL II SEMI-AUTOMATIC SINGLE PLATE HEAT SEALER

PART NO	DESCRIPTION
500090	MiniSeal II semi-automatic single plate heat sealer 110V / 220V Supplied complete with two plate adapter blocks, plate weight and line cord.
500083	Skirtless plate adapter 96 well
500084	Plate adapter flat top 384 PCR plate

229571



229572



MiniSeal II, Semi-automatic heat applied plate sealing system. For use with thermal seals and raised rim plates.

 See MiniSeal II (pg 30)

Porvair MiniSeal II Semi-Automatic Plate Heat Sealer

- ➔ Semi-automatic heat applied plate sealing system
- ➔ Seal SBS format micro well plates and tubes
- ➔ Seal time from 0.1 – 9.9 seconds, up to 200 °C
- ➔ Safe, simple slide operation
- ➔ No compressed air required
- ➔ For use with raised rim plate

The new MiniSeal II semi-automatic plate heat sealer builds on the reputation of our earlier Miniseal design for robustness and an ability to seal most types of plates. For users who need a tight seal on deep well plates, conventional sealers may not offer sufficient down force to guarantee a good seal.

With powerful stepper motor control and a mighty 450 watts of heating power available, the new MiniSeal II copes effortlessly with PCR, filter-bottomed, assay and deep well plates, EVEN if the plate itself is distorted or bowed. Easy to set up with simple up/down programming for both sealing time and sealing temperature, the MiniSeal II also boasts a robust drawer design that ensures excellent conformance to health and safety regulations.

With so much available power, sealing times for most polypropylene plates with Porvair seals are less than 3 seconds each. When plate sealing operation is completed, plates are automatically ejected from the MiniSeal II.

MiniSeal II comes complete with plate adapters for standard SBS microplates, deep well microplates and PCR plates. The unused adapters are designed to stack on top of the unit when not in use. Also included is a brass plate weight to keep your foils and seals flat during sealing.

Plate Adaptors

Stacks on top of unit when not in use

Front Panel Control Screen

Adjusts Seal Temperature
Adjusts Seal Duration



Safe, Simple Slide Operation

The sealing process is started by setting the plate and thermal seal in the drawer and pushing it fully into the unit. Once the drawer is pushed in, it will auto latch and the screen will display a sealing message, you may now release your grip on the handle. When the seal has finished, the drawer will automatically open, presenting the sealed plate for removal.

PORVAIR MINISEAL II SPECIFICATIONS

Power Supply:	220/115 VAC 50/60 Hz
Power Consumption:	600 W Nominal
Internal Heaters:	4 x 100 W (sealing plate), 50 W (heater mat on top of the block)
Dimensions:	7" w x 10.5" d x 11.5" h
Unit Weight:	14 lbs (9.2 kg)
Min Plate Height:	9 mm
Max Plate Height:	48 mm
Max Sealing Temp:	200 °C
Cycle Time (approx):	10 – 12 seconds (based on a 2 second seal)

PORVAIR MINISEAL II SEMI-AUTOMATIC SINGLE PLATE HEAT SEALER

PART NO	DESCRIPTION
500090	MiniSeal II semi-automatic single plate heat sealer 110V / 220V Supplied complete with two plate adapter blocks, plate weight and line cord.
500083	Skirtless plate adapter 96 well
500084	Plate adapter flat top 384 PCR plate



CHROM TECH RELATED PRODUCTS

96-6009



229572



Chrom Tech's mass spec plates are manufactured with virgin polypropylene and tested for low extractables.

PART NO	DESCRIPTION	QTY
96-6009	2 mL Square Well, Pyramid bottom, raised rim—compatible with heat sealer	50/cs
96-6001	1 mL Round Well, Round bottom, raised rim—compatible with heat sealer	50/cs
96-6002	2 mL Round Well, Round bottom, raised rim—compatible with heat sealer	50/cs
229572	Easily pierced 20 µm PP/PS lacquered aluminum foil—color coded green 125 mm x 78 mm sheets printed with color coding and right side up for ease of use	100/pk

Cerex Positive Pressure Processor for Sample Preparation

- ➔ Positive Pressure manifold provides uniform flow for all extraction steps
- ➔ All positions are individually restricted to provide even pressure to each column
Even flow can be maintained if you are using one, some, or all positions
- ➔ Self-adjusts to any plate height—accommodates all commercial 96-well plates

CEREX® SYSTEM 96

PART NO DESCRIPTION

288-0001 Cerex System 96 Processor

OPTION

288-1000 Heated Manifold Option for System 96 Pressure Processor

REPLACEMENT COMPONENT

278-0035 Column Seal for 96-Place Systems, Removable

**Includes 1 waste bin, 3 waste bin inserts, gas supply adapter and 48-place sealing gasket. SPE rack and collection rack must be ordered separately.*

 See Positive Pressure Manifolds (pg 54)

288-0001



TECH TIP

The optional heated manifold provides for rapid and thorough cartridge/well drying.

Porvair Evaporators

PORVAIR EVAPORATORS

MINIVAP™

ULTRAVAP LEVANTE™

ULTRAVAP MISTRAL™

MiniVap Gemini



MiniVap



- ➔ Manual control of the needle depth, gas temperature, and flow rate
- ➔ Changeable head to accommodate 24, 48, 96 straight or 96 spiral needles
- ➔ The Gemini has two individually temperature regulated evaporation positions

- ➔ Five password protected methods
- ➔ Each method has up to three timed stages
- ➔ Each timed stage controls:
 - Gas temperature
 - Gas flow rate
 - Needle depth
- ➔ Optional duct adapter for fume management

- ➔ 15 password protected methods
- ➔ Each method has up to five timed stages
- ➔ Each timed stage controls:
 - Gas temperature
 - Gas flow rate
 - Needle depth
- ➔ Robot Compatible
- ➔ Shuttle sends/retrieves plates from robot deck
- ➔ Built-in duct adapter for fume management

PORVAIR EVAPORATORS & ACCESSORIES

ULTRAVAP MISTRAL	ULTRAVAP LEVANTE	MINIVAP	MINIVAP GEMINI	DESCRIPTION
500147	500224	229201	500232	Evaporator with 96 spiral needles
500148	500225	229200	500233	Evaporator with 96 straight needles
500149	500226	229206	500234	Evaporator without a head (head required, sold separately)
500193	—	—	—	Mistral CAN bus interface cable with RS232 initiator and CAN terminator plugs
Included	500194	—	—	Duct Adapter/Fume extractor fan complete plug-in assy with housing

 See Porvair Evaporators (pg 56)

Sample Preparation

Chrom Tech Filtration	34
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Filter Vials	36
Filter Plates	37
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Agilent Technologies

porvair
sciences

Featured Products

34 Centrifuge Filter Tubes



37 Filter Plates



- Choose your filter membrane
- Choose your pore size
- Choose the plate/tube format

42 Agilent Bond Elut Plexa



The Bond Elut Plexa Family is a new generation of polymeric SPE products, designed for simplicity, improved analytical performance and ease-of-use.

Its uniqueness lies in the novel hydroxylated exterior, hydrophobic interior and advanced polymeric architecture.

54 Cerex Positive Pressure Processor



- Positive Pressure manifold provides uniform flow for all extraction steps.
- All positions are individually restricted to provide even pressure to each column. Even flow can be maintained if you are using one, some, or all positions.

56 Porvair Evaporators



MiniVap Gemini

- 15 password protected methods
- Each method has up to five timed stages
- Each timed stage controls: gas temperature, gas flow rate, and needle depth
- Robot Compatible
- Shuttle sends/retrieves plates from robot deck
- Built-in duct adapter for fume management
- The Gemini has two individually temperature regulated evaporation positions

Notes from the Support Desk

Why Positive Pressure vs Vacuum Manifold for Sample Preparation?

A major problem with conventional vacuum manifolds occurs as faster flowing channels in the SPE plate (or cartridges) run dry, allowing a free flow path for vacuum through the dry ports, thereby slowing the flow in the remaining wells. The result is variation in column processing times, thus contributing to irreproducible analyte recoveries.

In contrast, our positive pressure manifolds have restricted-flow gas ports. These ports create superior flow control such that even if 95 out of 96 wells (47 out of 48 ports) are empty, dry, or wet, the remaining single port will receive normal pressure to allow easy processing.

Our positive pressure manifolds are an efficient solution to viscous samples. Vacuum manifolds often cannot provide adequate processing power, since the maximum pressure is limited to less than atmospheric pressure (approx. 15 psi). The positive pressure manifold allows for gas pressures up to the supplied line pressure (typically 60-75 PSI), thus supplying greater motive force for viscous sample flow. Adjusting the pressure up or down, produces a column flow response that is smooth and immediate.



Centrifuge Filter Tubes

CENTRIFUGE FILTER TUBES				
MEMBRANE	PORE SIZE	MICRO 100/pk	MIDI 25/pk	MAXI 50/pk
Nylon	0.2 µm	CTF-NY020-01	CTF-NY020-02	CTF-NY020-03
	0.45 µm	CTF-NY045-01	CTF-NY045-02	CTF-NY045-03
PTFE (polytetrafluoroethylene)	0.2 µm	CTF-PT020-01	CTF-PT020-02	CTF-PT020-03
	0.45 µm	CTF-PT045-01	CTF-PT045-02	CTF-PT045-03
PVDF (polyvinylidene difluoride)	0.2 µm	CTF-PV020-01	CTF-PV020-02	CTF-PV020-03
	0.45 µm	CTF-PV045-01	CTF-PV045-02	CTF-PV045-03
PES (polyethersulfone)	0.2 µm	CTF-PS020-01	CTF-PS020-02	CTF-PS020-03
	0.45 µm	CTF-PS045-01	CTF-PS045-02	CTF-PS045-03
CA (cellulose acetate)	0.2 µm	CTF-CA020-01	CTF-CA020-02	CTF-CA020-03
	0.45 µm	CTF-CA045-01	CTF-CA045-02	CTF-CA045-03
PP (polypropylene)	0.2 µm	CTF-PP020-01	CTF-PP020-02	CTF-PP020-03
	0.45 µm	CTF-PP045-01	CTF-PP045-02	CTF-PP045-03
RC (regenerated cellulose)	0.2 µm	CTF-RC020-01	CTF-RC020-02	CTF-RC020-03
	0.45 µm	CTF-RC045-01	CTF-RC045-02	CTF-RC045-03
NC (nitrocellulose)	0.2 µm	CTF-NC020-01	CTF-NC020-02	CTF-NC020-03
	0.45 µm	CTF-NC045-01	CTF-NC045-02	CTF-NC045-03
Forensic Spin Tube	1.4 mm mesh	CTF-FS000-01	—	—



Micro-Spin Filter Tubes

- 850 µL sample capacity
- 2 mL graduated receiver tube and cap
- Maximum G-force: 10,000xG



Midi-Spin Filter Tubes

- 4 mL sample capacity
- 7 mL graduated receiver tube and cap
- Maximum G-force: 5,000xG



Maxi-Spin Filter Tubes

- 25 mL sample capacity
- 50 mL graduated receiver tube and cap
- Maximum G-force: 2,500xG

Bulk Empty Centrifuge Tubes

BULK EMPTY CENTRIFUGE TUBES					
VOLUME	0.5 mL	1.5 mL	2.0 mL	15 mL	50 mL
QTY	5,000/pk	5,000/pk	5,000/pk	500/pk	500/pk
PART NO	CNT005	CNT015	CNT020	CNT150	CNT500

Membrane Selection Guide

MEMBRANE	AQUEOUS	ORGANIC	LOW PROTEIN BINDING	APPLICATION
Nylon	●	●	●	Commonly used for general laboratory filtration of HPLC samples prior to injection. Nylon is solvent resistant and exhibits low extractables. Nylon binds protein and should not be used when protein recovery is important.
PTFE	●	●	●	PTFE is hydrophobic and chemically resistant to all solvents, acids and bases. Does not impart extractables to the filtrate. PTFE blocks water vapor, making it ideal for transducer protectors.
PVDF	●	●	●	PVDF (polyvinylidene difluoride) is a solvent resistant membrane that exhibits low levels of UV adsorbing extractables. Use for HPLC sample filtration and general biological filtration. PVDF is a low protein binding membrane.
PES	●	●	●	PES (polyethersulfone) is a mechanically strong membrane low in inorganic extractable ions. Typical applications: Ion chromatography, tissue culture filtration, filtration of proteins and nucleic acids.
Cellulose Acetate	●	●	●	Cellulose Acetate is a very low protein binding membrane (binds less protein than PVDF), ideal for aqueous based samples. CA membranes are an excellent choice when maximum protein recovery in filtrate is critical.
PP	●	●	●	Polypropylene is a hydrophilic membrane that exhibits a wide range of chemical compatibility to organic solvents. A good choice for HPLC sample filtration when performing chromatography protein analysis.
RC	●	●	●	Regenerated Cellulose (RC) is a hydrophilic, solvent resistant, low protein binding membrane. Ideal for removing particulates from HPLC samples prior to injection. Extractables with water are less than 1%.
NC	●	●	●	Nitrocellulose (NC) - Mixed Esters (ME) - unsupported filters are hydrophilic and composed of a mixture of inert cellulose nitrate and cellulose acetate polymers. Fast flow rates due to the uniform structure of membrane.

Syringe Filters

SYRINGE FILTERS (100/PK)					SPECIFICATIONS	
MEMBRANE	PORE SIZE	13 mm	17 mm	30 mm	Effective Filtration Area:	
Nylon	0.2 µm	F13-NY020	F17-NY020	F30-1020	13 mm: 0.8 cm ²	
	0.45 µm	F13-NY045	F17-NY045	F30-1045	17 mm: 1.0 cm ²	30 mm: 3.9 cm ²
PTFE (polytetrafluoroethylene)	0.2 µm	F13-PT020	F17-PT020	F30-2020		
	0.45 µm	F13-PT045	F17-PT045	F30-2045		
PVDF (polyvinylidene difluoride)	0.2 µm	F13-PV020	F17-PV020	F30-5020		
	0.45 µm	F13-PV045	F17-PV045	F30-5045		
PES (polyethersulfone)	0.2 µm	F13-PS020	F17-PS020	—		
	0.45 µm	F13-PS045	F17-PS045	F30-6045		
CA (cellulose acetate)	0.2 µm	F13-CA020	F17-CA020	—		
	0.45 µm	F13-CA045	F17-CA045	F30-4045		
PP (polypropylene)	0.2 µm	F13-PP020	F17-PP020	—		
	0.45 µm	F13-PP045	F17-PP045	F30-3045		
RC (regenerated cellulose)	0.2 µm	F13-RC020	F17-RC020	F30-7020		
	0.45 µm	F13-RC045	F17-RC045	F30-7045		
NC (nitrocellulose)	0.2 µm	F13-NC020	F17-NC020	—		
	0.45 µm	F13-NC045	F17-NC045	—		
Glass Fiber	1.0 µm	F13-GF100	F17-GF100	F30-8120		
	multi	F13-GFX	F17-GFX	—		

Sample Volume:	
13 mm:	< 10 mL
17 mm:	< 12 mL
25 mm:	< 150 mL


Inlet/Outlet Connections:	
	Female luer lock inlet, male slip luer outlet

Max Temperature:	
	131 °F (55 °C) at 30 PSI

Max Pressure:	
13 mm:	100 PSI
17 mm:	130 PSI
25 mm:	60 PSI at 75 – 75 °F (21 - 24 °C)
	30 PSI at 131 °F (55 °C)

Membrane Sheets

Any of the available membranes can also be purchased as sheets.

 **Contact Chrom Tech Support Desk for a quote—support@chromtech.com**

Membrane Filters

MEMBRANE FILTERS						
MEMBRANE	PORE SIZE	13 mm 100/pk	25 mm 100/pk	47 mm 100/pk	90 mm 25/pk	142 mm 25/pk
Nylon	0.2 µm	CTF-NY020-13	CTF-NY020-25	CTF-NY020-47	CTF-NY020-90	CTF-NY020-142
	0.45 µm	CTF-NY045-13	CTF-NY045-25	CTF-NY045-47	CTF-NY045-90	CTF-NY045-142
PTFE (polytetrafluoroethylene)	0.2 µm	CTF-PT020-13	CTF-PT020-25	CTF-PT020-47	CTF-PT020-90	CTF-PT020-142
	0.45 µm	CTF-PT045-13	CTF-PT045-25	CTF-PT045-47	CTF-PT045-90	CTF-PT045-142
PVDF (polyvinylidene difluoride)	0.2 µm	CTF-PV020-13	CTF-PV020-25	CTF-PV020-47	CTF-PV020-90	CTF-PV020-142
	0.45 µm	CTF-PV045-13	CTF-PV045-25	CTF-PV045-47	CTF-PV045-90	CTF-PV045-142
PES (polyethersulfone)	0.2 µm	CTF-PS020-13	CTF-PS020-25	CTF-PS020-47	CTF-PS020-90	CTF-PS020-142
	0.45 µm	CTF-PS045-13	CTF-PS045-25	CTF-PS045-47	CTF-PS045-90	CTF-PS045-142
Cellulose Acetate	0.2 µm	CTF-CA020-13	CTF-CA020-25	CTF-CA020-47	CTF-CA020-90	CTF-CA020-142
	0.45 µm	CTF-CA045-13	CTF-CA045-25	CTF-CA045-47	CTF-CA045-90	CTF-CA045-142
NC (nitrocellulose)	0.2 µm	CTF-NC020-13	CTF-NC020-25	CTF-NC020-47	CTF-NC020-90	CTF-NC020-142
	0.45 µm	CTF-NC045-13	CTF-NC045-25	CTF-NC045-47	CTF-NC045-90	CTF-NC045-142
Glass Fiber	0.7 µm	CTF-GF070-13	CTF-GF070-25	CTF-GF070-47	CTF-GF070-90	—
	1.0 µm	CTF-GF100-13	CTF-GF100-25	CTF-GF100-47	CTF-GF100-90	—
	3.1 µm	CTF-GF310-13	CTF-GF310-25	CTF-GF310-47	CTF-GF310-90	—
	5.0 µm	CTF-GF500-13	CTF-GF500-25	CTF-GF500-47	CTF-GF500-90	—



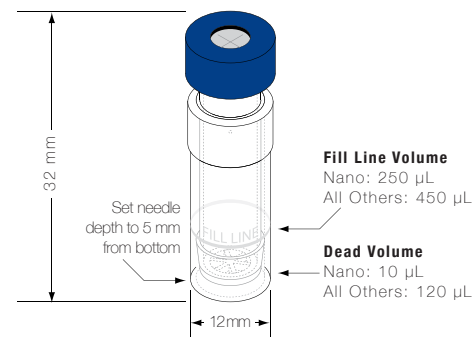
FILTRATION ASSEMBLY APPARATUS		
DESCRIPTION	47 mm (300 mL capacity)	90 mm (1,000 mL capacity)
Microfiltration Assembly, No 8 Stopper (includes: funnel, base, clamp & stopper)	F-410047	F-410090
Glass Funnel	F-410048	F-410092
Glass Support Base, Fritted	F-410050	F-410094
Aluminum Clamp	F-410052	F-410096
Silicone Stopper, #8	F-410054	F-410054
Flask, 1 L, #8 Silicone Stopper	F-410404	F-410404



Thomson Filter Vials

- ➔ Filter, vial and cap—all in one design
- ➔ Simple to use and easy to press down—No tools required

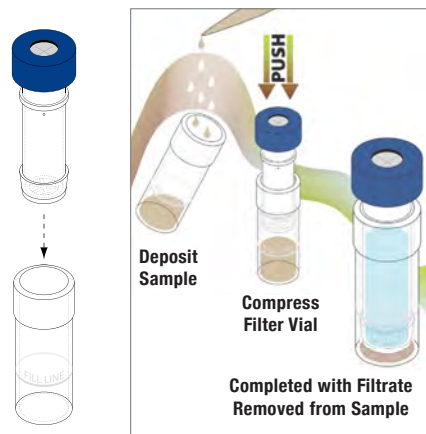
No multiple step transfers needed. Pre-slit caps for all filter vials, with the exception of the low evaporation caps, ensure a no-hassle, clean aliquot withdrawal. No more breakage of expensive needles or coring problems on the HPLC or Mass Spectrometer. Thomson Filter Vials are compatible with most standard autosamplers. The ease of use will make the Thomson Filter Vials indispensable in all labs.



FEATURES	FOUR FILTER VIAL STYLE OPTIONS			
	Standard	Low Evap	eXtreme	nano
450 μ L max volume, 120 μ L dead volume	●	●	●	
250 μ L max volume, 10 μ L dead volume				●
Pre-slit PTFE/Silicone Snap cap	●		●	●
Low evaporation PTFE/Silicone Crimp cap		●		
Multi-layered filtration			●	

TECH TIP | Thomson Filter Vial & Protein Crash

Protein samples need to be crashed out before injecting them into the HPLC. Many people have traditionally done off line crash procedures. The Thomson PTFE Filter Vials can do this easily by mixing the acetonitrile and aqueous solution in the bottom chamber, and then allowing the filter to push down trapping the protein, and letting the clean sample come through for analysis.



The plunger filter membrane nestles into the vial while simultaneously filtering and readying the sample for any autosampler. This is a single step process that minimizes any loss of sample.

THOMSON FILTER VIALS (100/PK)						
MEMBRANE	PORE SIZE	CAP COLOR	STANDARD ¹	LOW EVAP ²	EXTREME ¹	NANO ³
Nylon	0.2 μ m	Black	FV-1020	FV-1020LE	FV-1020EX	FV-1020N
	0.45 μ m	Pink	FV-1045	FV-1045LE	FV-1045EX	—
PTFE (polytetrafluoroethylene)	0.2 μ m	Green	FV-2020	FV-2020LE	FV-2020EX	FV-2020N
	0.45 μ m	Blue	FV-2045	FV-2045LE	FV-2045EX	FV-2045N
PVDF (polyvinylidene difluoride)	0.2 μ m	Red	FV-3020	FV-3020LE	FV-3020EX	FV-3020N
	0.45 μ m	Yellow	FV-3045	FV-3045LE	FV-3045EX	FV-3045N
PES (polyethersulfone)	0.2 μ m	Grey	FV-6020	—	FV-6020EX	FV-6020N

1) Standard & Extreme includes: Pre-slit PTFE/Silicone Septa Snap Cap attached to a Plunger Filter, outside PP shell vial (250 μ L dead volume, 450 μ L max volume).

2) Low Evaporation includes: PTFE/Silicone Septa Crimp Cap attached to a Plunger Filter, outside PP shell vial (250 μ L dead volume 450 μ L max volume).

3) Nano includes: Pre-slit PTFE/Silicone Septa Snap Cap attached to a Plunger Filter, outside PP shell vial (10 μ L dead volume, 250 μ L max volume).

Filter Plates

96 WELL FILTER PLATES				
MEMBRANE	PORE SIZE	VOL/WELL	QTY/CS	PART NO
Nylon	0.2 µm	1 mL	ea	96F-NY020
	0.45 µm	300 µL	50	★ CT-9645
	0.45 µm	1 mL	ea	96F-NY045
PTFE (polytetrafluoroethylene)	0.2 µm	1 mL	ea	96F-PT020
	0.2 µm	2 mL	10	★ OC-9279020
	0.45 µm	1 mL	ea	96F-PT045
PVDF (polyvinylidene difluoride)	0.2 µm	1 mL	ea	96F-PV020
	0.45 µm	1 mL	ea	96F-PV045
PES (polyethersulfone)	0.2 µm	1 mL	ea	96F-PS020
	0.45 µm	1 mL	ea	96F-PS045
	0.45 µm	2 mL	25	96F-PS045-2
CA (cellulose acetate)	0.2 µm	1 mL	ea	96F-CA020
	0.45 µm	1 mL	ea	96F-CA045
PP (polypropylene)	0.2 µm	1 mL	ea	96F-PP020
	0.45 µm	1 mL	ea	96F-PP045
	0.45 µm	2 mL	25	96F-PP045-2
Captiva PP (polypropylene)	0.2 µm	1 mL	5	A5960002
	0.45 µm	1 mL	5	A5960045
	20 µm	1 mL	5	A596002000
RC (regenerated cellulose)	0.2 µm	1 mL	ea	96F-RC020
	0.45 µm	1 mL	ea	96F-RC045
NC (nitrocellulose)	0.2 µm	1 mL	ea	96F-NC020
	0.45 µm	1 mL	ea	96F-NC045

★ **TOP SELLER!**



All Captiva components are ultra clean, and rigorously tested to ensure against non-specific binding.

MOLECULAR WEIGHT CUT-OFF 96 WELL FILTER PLATES				
MEMBRANE	MWCO	VOL/WELL	QTY/CS	PART NO
PES (polyethersulfone)	10K	0.4 mL	25	201013-100
	30K	0.4 mL	25	201015-100
	100K	0.4 mL	25	201596-100
	300K	0.4 mL	25	201598-100

■ MWCO APPLICATIONS

- ➔ Separating large molecules from small molecules
- ➔ Removal of unincorporated label following protein modification reactions
- ➔ Concentration of protein peaks following gel-permeation chromatography
- ➔ Protein concentration with tissue culture media, antiserum or monoclonal antibody preparations
- ➔ Concentration and desalt/buffer-exchange after eluting protein from ion-exchange, hydrophobic interaction (HIC), metal chelate or affinity chromatography columns

■ CUSTOMIZE YOUR OWN FILTER PLATE

- ➔ Choose your filter membrane
- ➔ Choose your pore size
- ➔ Choose the plate format



Contact Chrom Tech Support Desk
for a quote—support@chromtech.com

Membrane Selection Guide

MEMBRANE	AQUEOUS	ORGANIC	LOW PROTEIN BINDING		APPLICATION
			●	●	
Nylon	●	●	●	●	Commonly used for general laboratory filtration of HPLC samples prior to injection. Nylon is solvent resistant and exhibits low extractables. Nylon binds protein and should not be used when protein recovery is important.
PTFE	●	●	●	●	PTFE is hydrophobic and chemically resistant to all solvents, acids and bases. Does not impart extractables to the filtrate. PTFE blocks water vapor, making it ideal for transducer protectors.
PVDF	●	●	●	●	PVDF (polyvinylidene difluoride) is a solvent resistant membrane that exhibits low levels of UV adsorbing extractables. Use for HPLC sample filtration and general biological filtration. PVDF is a low protein binding membrane.
PES	●	●	●	●	PES (polyethersulfone) is a mechanically strong membrane low in inorganic extractable ions. Typical applications: Ion chromatography, tissue culture filtration, filtration of proteins and nucleic acids.
Cellulose Acetate	●	●	●	●	Cellulose Acetate is a very low protein binding membrane (binds less protein than PVDF), ideal for aqueous based samples. CA membranes are an excellent choice when maximum protein recovery in filtrate is critical.
PP	●	●	●	●	Polypropylene is a hydrophilic membrane that exhibits a wide range of chemical compatibility to organic solvents. A good choice for HPLC sample filtration when performing chromatography protein analysis.
RC	●	●	●	●	Regenerated Cellulose (RC) is a hydrophilic, solvent resistant, low protein binding membrane. Ideal for removing particulates from HPLC samples prior to injection. Extractables with water are less than 1%.
NC	●	●	●	●	Nitrocellulose (NC) - Mixed Esters (ME) - unsupported filters are hydrophilic and composed of a mixture of inert cellulose nitrate and cellulose acetate polymers. Fast flow rates due to the uniform structure of membrane.

Protein Crash Filter Plates

- ➔ Semi-automate your protein crash assays
- ➔ Speed up your analysis—Allows high throughput sample prep
- ➔ Improve reproducibility—Protein precipitate is removed by filtration
- ➔ Eliminate supernatant transfer step

Our protein crash plate allows simple, rapid, high throughput sample preparation. The graded frit design is optimized to efficiently remove precipitated protein without plugging or breakthrough.

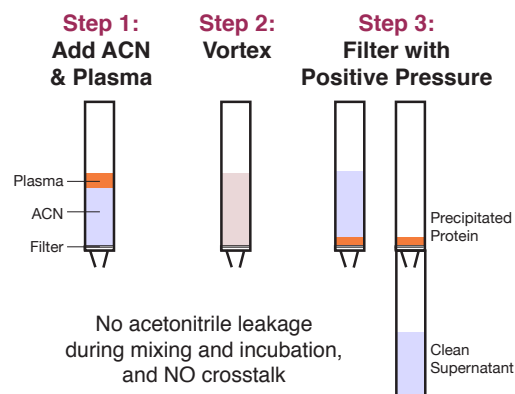
Protein precipitation can be accomplished in the plate wells, minimizing sample handling. Protein precipitate is removed by filtration, eliminating time consuming centrifugation and transfer steps.

These plates are compatible with all existing industry standard liquid handling stations.

Protein Crash Filter Plates Protocol

1. Acetonitrile/serum is used in the ratio of 3:1 (v/v).
2. The serum is spiked with the standard.
3. Acetonitrile and serum sample is added to the well.
4. Cover plate with cap mat and vortex.
5. The plates may be vortexed with collection trays in place so the plate tips do not come in contact with the vortexer platform.
6. The samples may be extracted with positive pressure using our 96 positive pressure processor (288-0001).

Semi-Automate Protein Crash



- ➔ Semi-automate your protein crash assays
- ➔ Speed up your analysis—Allows high throughput sample preparation
- ➔ Improve reproducibility—Protein precipitate is removed by filtration
- ➔ Eliminate supernatant transfer step



PROTEIN CRASH 96 WELL FILTER PLATES

DESCRIPTION	VOL/WELL	QTY	PART NO
Protein crash filter plate, 0.2 µm cut-off	2 mL	20	OC-9270B-20

96 WELL PLATE ACCESSORIES

DESCRIPTION	QTY	PART NO
Round 1 mL collection plate	50/cs	96-6001
Square 2 mL collection plate	50/cs	96-6009
Adhesive Free Zone Sealing Film	50/cs	ZAF-PE-50
Capmat for square well filter plate	50/cs	96-0662
96 Round Sealing Silicone Mat, 7mm	10/pk	96M-03
2 mil Blue PTFE 96-Well Pattern Film	100/cs	BST-9790
5 mil Blue PTFE 96-Well Pattern Film	100/cs	BST-9791

96 WELL PLATE INSTRUMENTATION

Vortexer, 0 – 2600 rpm, 0 – 60 sec. timer	ea	CT-V2600
Positive Pressure Manifold for 96 well plate	ea	288-0001
MiniSeal II Semi-Automatic Heat Sealer	ea	500090



Visit our website at www.chromtech.com for more detailed product information



See 96 Well-Plate Instrumentation (pg 30-31)

Agilent Captiva Filtration

Captiva ND

- ➔ Easy automation—non drip design resists organic solvent flow until vacuum is applied
- ➔ Exceptional flow—dual depth filter avoids plugged membranes and lost samples
- ➔ Efficient protein removal using Acetonitrile or Methanol—MS-suitable samples in as little as one-fifth the time
- ➔ Multiple pore sizes available for greater flexibility with solvent use

Captiva ND^{Lipids}

- ➔ More precise and reproducible quantitation with removal of ion-suppressing phospholipids and proteins
- ➔ Combines the ease of use and superior flow properties of Captiva ND with a unique chemical filter
- ➔ To optimize lipid removal—Methanol recommended



Captiva ND^{Lipids} 96-well filtration starter kit, A59640002SK

TECH TIP

Using Captiva ND^{Lipids} with methanol is an excellent replacement for acetonitrile as the precipitation solvent. Methods with methanol show better removal of lipids than with acetonitrile.

AGILENT CAPTIVA FILTRATION

DESCRIPTION	QTY	PART NO
CAPTIVA ND 96-WELL FILTER PLATES		
Captiva ND plate, 0.2 µm, polypropylene Recommended for both methanol and acetonitrile	5/pk	A5969002
Captiva ND plate, 0.45 µm, polypropylene Suitable for acetonitrile only	5/pk	A5969045
CAPTIVA ND^{LIPIDS}		
Captiva ND ^{Lipids} 96-well filtration starter kit Includes 1 CaptiVac vacuum collar, 2 Captiva ND ^{Lipids} filter plates, 2 Captiva 96 deep-well 1 mL collection plates 2 Captiva collection plate pierceable covers	ea	A59640002SK
Captiva ND ^{Lipids} 96-well filtration replacement kit Includes 2 Captiva ND ^{Lipids} filter plates, 2 Captiva 96 deep-well 1 mL collection plates and 2 Captiva collection plate pierceable covers	ea	A59640002RK
Captiva ND ^{Lipids} 96-well filtration plate	100/pk	A59640002B
Captiva ND ^{Lipids} 96-well filter plate, 1 mL well	ea	A59640002I
Captiva ND ^{Lipids} 96-well filter plates, 1 mL well	5/pk	A59640002V
DuoSeal 96-well plate seals	10/pk	A8961008

Agilent Econofilters

- ➔ Agilent high quality syringe filters that provide efficient filtration at a reasonable price

AGILENT ECONOFILTERS (1,000/PK)

MEMBRANE	PORE SIZE	13 mm	25 mm
Nylon	0.2 µm	5190-5269	5190-5271
	0.45 µm	5190-5270	5190-5272
PTFE (polytetrafluoroethylene)	0.2 µm	5190-5265	5190-5267
	0.45 µm	5190-5266	5190-5268
PVDF (polyvinylidene difluoride)	0.2 µm	5190-5261	5190-5263
	0.45 µm	5190-5262	5190-5264
PES (polyethersulfone)	0.2 µm	5190-5273	5190-5275
	0.45 µm	5190-5274	5190-5276
PP (polypropylene)	0.2 µm	5190-5277	5190-5279
	0.45 µm	5190-5278	5190-5280



Agilent QuEChERS | Featuring Enhanced Matrix Removal EMR—Lipid

Step 1: Extraction

METHOD	BUFFERED	CONTENTS	WITH 50 mL TUBES (50/pk)
AOAC 2007.01	Yes	6 g MgSO ₄ ; 1.5 g NaAcetate	5982-5755CH
Original (10 g samples)	No	4 g MgSO ₄ ; 1 g NaCl	5982-5550CH
Original (15 g samples)	No	6 g MgSO ₄ ; 1.5 g NaCl	5982-5555CH
EN 15662	Yes	4 g MgSO ₄ ; 1 g NaCl; 1 g NaCitrate; 0.5 g disodium citrate sesquihydrate	5982-5650CH

Part numbers ending in CH indicate tubes containing ceramic homogenizers



Ceramic homogenizers (100/pk)
5982-9313 for 50 mL tubes
5982-9311 for 2 mL tubes

Step 2: Dispersive SPE Cleanup

KIT	SIZE	UNIT	KIT CONTENTS PART NO
EMR—Lipid dSPE	15 mL		1 g EMR material 5982-1010
EMR—Lipid Polish Pouch	15 mL	50/pk	anhydrous MgSO ₄ 5982-0102

KIT	SIZE	UNIT	AOAC 2007.01 METHOD KIT CONTENTS PART NO	EUROPEAN METHOD EN 15662 KIT CONTENTS PART NO
General fruits and vegetables Removes polar organic acids, some sugars and lipids	2 mL	100/pk	50 mg PSA 150 mg MgSO ₄ 5982-5022 5982-5022CH	25 mg PSA 150 mg MgSO ₄ 5982-5021 5982-5021CH
	15 mL	50/pk	400 mg PSA 1200 mg MgSO ₄ 5982-5058 5982-5058CH	150 mg PSA 900 mg MgSO ₄ 5982-5056 5982-5056CH
Fruits and vegetables with fats and waxes: Removes polar organic acids, some sugars, more lipids and sterols	2 mL	100/pk	50 mg PSA 50 mg C18EC 150 mg MgSO ₄ 5982-5122 5982-5122CH	25 mg PSA 25 mg C18EC 150 mg MgSO ₄ 5982-5121 5982-5121CH
	15 mL	50/pk	400 mg PSA 400 mg C18EC 1200 mg MgSO ₄ 5982-5158 5982-5158CH	150 mg PSA 150 mg C18EC 900 mg MgSO ₄ 5982-5156 5982-5156CH
Pigmented fruits and vegetables: Removes polar organic acids, some sugars and lipids, and carotenoids and chlorophyll; not for use with planar pesticides	2 mL	100/pk	50 mg PSA 50 mg GCB 150 mg MgSO ₄ 5982-5222 5982-5222CH	25 mg PSA 25 mg GCB 150 mg MgSO ₄ 5982-5221 5982-5221CH
	15 mL	50/pk	400 mg PSA 400 mg GCB 1200 mg MgSO ₄ 5982-5258 5982-5258CH	150 mg PSA 150 mg GCB 885 mg MgSO ₄ 5982-5256 5982-5256CH

Part numbers ending in CH indicate tubes containing ceramic homogenizers

TECH TIP | Is EMR—Lipid right for my sample?

EMR—Lipid Removal is recommended when:

- ➔ Fatty sample, high lipid content, sample mass in grams i.e.: avocado, meat, fish, etc.
- ➔ Target compound(s) do not have a 5+ carbon unbranched aliphatic chain
- ➔ Target compound is soluble in acetone or ACN (any pH)

EMR—LIPID QuEChERS

Extraction/partition (6 steps)

Mix and centrifuge

Transfer to dSPE
(EMR—Lipid & H2O)

Mix and centrifuge

Polish

Evaporate/reconstitute or dilute

Transfer to A/S vial

The innovative sorbent in EMR—Lipid replaces C18/PSA in your QuEChERS methodology to significantly reduce matrix effects and improve analyte recoveries. It can be universally applied to the analysis of polar, mid-polar and non-polar target analytes, providing effective matrix removal.

Polish step is omitted for tetracycline analysis.

Application and Tech Notes

EMR—Lipid

Recommended Protocols for Enhanced Matrix Lipid—Removal
5991-6057EN

Multiresidue Analysis of Pesticides in Avocado with Agilent Bond Elut Enhanced Matrix Removal—Lipid -by LC/MS/MS **5991-6098EN**
-by GC/MS/MS **5991-6097EN**

PAH Analysis in Salmon with Enhanced Matrix Removal **5991-6088EN**

Multiresidue Analysis of Veterinary Drugs in Bovine Liver by LC/MS/MS **5991-6096EN**

Contact Chrom Tech for additional information

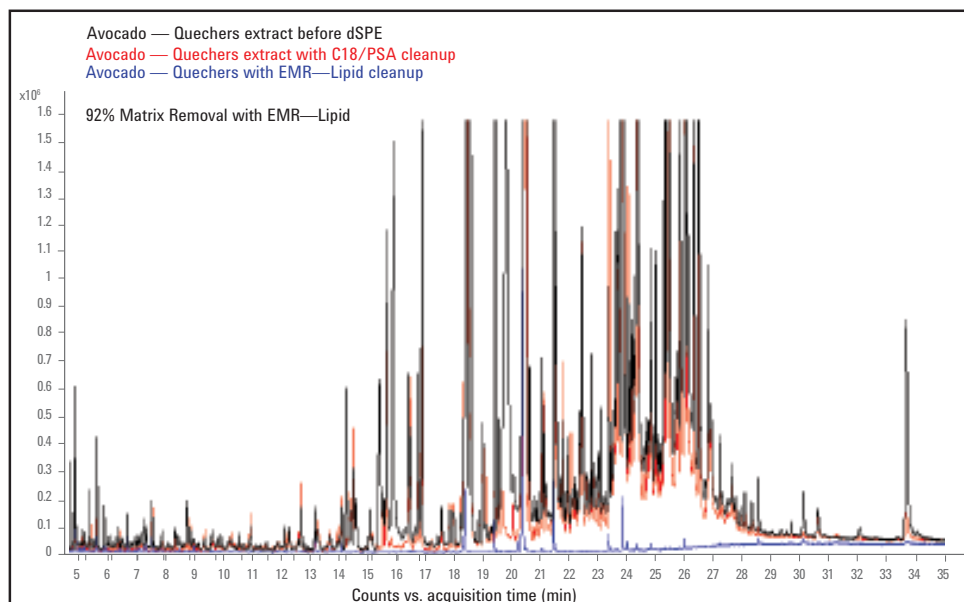
Agilent Enhanced Matrix Removal—Lipid

Struggling with matrix interferences due to lipids?—Now, you don't have to choose between lipid removal and analyte recovery, because the innovative Agilent Enhanced Matrix Removal—Lipid delivers the most complete matrix removal and analyte recovery of any sample prep product on the market.

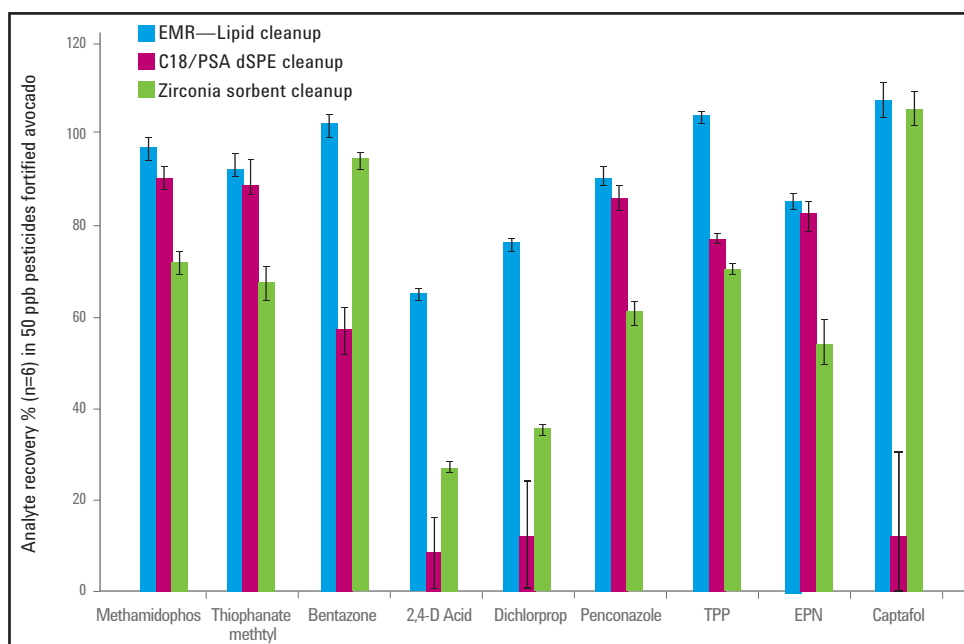
Enhanced Matrix Removal—Lipid, unlike any other type of sample prep, is a unique sorbent that selectively removes lipids in complex matrices and challenging high-fat samples such as avocado, so you can remove lipids without losing your analytes.

EMR—Lipid replaces dSPE sorbent in familiar QuEChERS workflows:

- Improves existing QuEChERS and dSPE workflows
- Expands QuEChERS capabilities to include high fat samples



GC/MS full-scan chromatogram overlay of an untreated QuEChERS avocado extract (black), compared to traditional C18/PSA cleanup (red) and an extract treated with Agilent Enhanced Matrix Removal—Lipid (blue).



Recovery data for multiple pesticide residue analysis in avocado, showing some of the 73 pesticides analyzed. Using Agilent Enhanced Matrix Removal—Lipid, 92% of the pesticides fell within the acceptable recovery range of 70 to 120%.

The Benefits of using the new and innovative EMR—Lipid for QuEChERS are clear

- ➔ **Improved productivity:** better sensitivity and signal-to-noise from fewer matrix interferences enable faster data processing and greater sample throughput
- ➔ **Reduced lab costs:** cleaner samples using EMR—Lipid can offer significantly reduced MS source maintenance
 - Reduce instrument downtime
- ➔ **Simplified workflows:** standardize on an easy-to-use single-sorbent procedure that maximizes analyte recovery from a wide variety of fatty samples. Save time and money by reducing material costs, inventory, training time, and documentation, thereby streamlining your lab productivity
- ➔ **Higher quality results:** a cleaner sample profile leads to greater data integrity and confidence in results, faster data processing, and fewer re-runs.

To increase your success with EMR and maximize your results, please watch the "how-to" video on our website (http://www.chromtech.com/products/sample_preparation/agilent/Agilent_EMR_Lipid_Demo.mp4).

Agilent Bond Elut Plexa Polymeric SPE

The Bond Elut Plexa Family is a new generation of polymeric SPE products, designed for simplicity, improved analytical performance and ease-of-use. Its uniqueness lies in the novel hydroxylated exterior, hydrophobic interior and advanced polymeric architecture.



Bond Elut Plexa

- Fast flow, reproducible performance and ease-of-use
- Improved extract cleanliness minimizes sample matrix interferences
- Non-polar retention mechanism

Typical Method for Bond Elut Plexa

Sample:

100 µL Plasma

Pretreatment:

Dilute 1:3 with:
2% NH₄OH (*neutrals & bases*)
1% HCO₂H (*acids*)

Conditioning:

1. 500 µL MeOH
2. 500 µL H₂O

Washes:

500 µL 5% MeOH in H₂O

Elution:

2 x 250 µL MeOH
Volumes stated are for a 30 mg, 1 mL SPE format device

Bond Elut Plexa PCX

- Mixed mode, non-polar polymeric cation exchanger offers high level of analyte selectivity
- Faster flow rates improve productivity
- Extraction cleanliness and reduced interference improve precision
- Simplified, single method for ease-of-use

Typical Method for Bond Elut Plexa PCX

Sample:

100 µL Plasma

Pretreatment:

Dilute 1:3 with 2% H₃PO₄

Conditioning:

1. 500 µL MeOH
2. 500 µL H₂O

Washes:

Acidic: 500 µL aqueous 2% formic acid
Neutral: 500 µL CH₃OH/CH₃CN (1:1, v/v)

Elution:

500 µL CH₃OH/CH₃CN + 5% NH₃ (28-30%)
Volumes stated are for Bond Elut 96 30 mg, 1 mL, P/N A4968030

Bond Elut Plexa PAX

- Mixed mode, non-polar polymeric anion exchanger offers high level of analyte selectivity
- Exclusion of endogenous interferences offers superior cleanliness and minimizes ion suppression
- Simple, single method for ease-of-use, reduces development time

Typical Method for Bond Elut Plexa PAX

Sample:

100 µL human plasma

Pretreatment:

Dilute 1:3 with 2% NH₄OH

Conditioning:

1. 500 µL MeOH
2. 500 µL H₂O

Washes:

1. 500 µL H₂O
2. 500 µL MeOH

Elution:

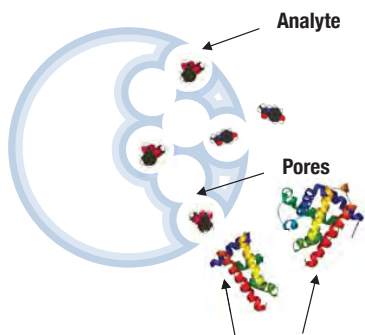
500 µL 5% formic acid:MeOH
Volumes stated are for Bond Elut 96 1 mL Well Plate, P/N A4967010



Advanced Polymer Architecture Improves Extraction Performance

LOAD:

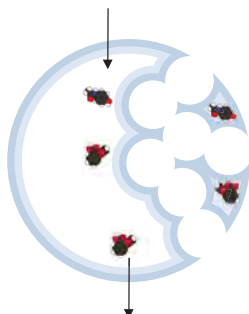
Water-rich, hydrophilic surface allows excellent phase transfer of analytes into the polymer core.



Large endogenous proteins do not bind to the surface of the polymer and cannot access pore structure.

WASH:

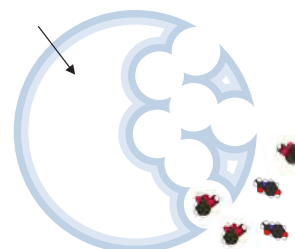
Analytes that have crossed the hydrophilic layers will remain tightly bound in the hydrophobic core.



Interferences wash away without leaching the analytes of interest.

ELUTE:

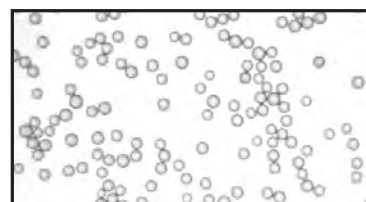
Specifically engineered pore structure allows excellent mass transfer out of the polymer.



Clean extract with high recovery.

AGILENT BOND ELUT PLEXA POLYMERIC SPE					
SORBENT MASS	VOLUME	QTY	PLEXA	PLEXA PCX	PLEXA PAX
96-WELL PLATES					
10 mg	1 mL, Round	100/pk	A4969010	A4968010	A4967010
10 mg	2 mL Square	100/pk	A3969010	A3968010	A3967010
30 mg	1 mL, Round	100/pk	A4969030	A4968030	A4967030
30 mg	2 mL Square	100/pk	A3969030	A3968030	A3967030
STRAIGHT BARREL CARTRIDGES					
30 mg	1 mL	100/pk	12109301	12108301	12107301
30 mg	1 mL Tabless	100/pk	12109301T	—	—
30 mg	3 mL	50/pk	12109303	12108303	12107303
60 mg	1 mL	100/pk	12109601	12108601	12107601
60 mg	3 mL	50/pk	12109603	12108603	12107603
60 mg	3 mL Tabless	50/pk	—	12108603T	—
200 mg	3 mL	50/pk	12109610	—	—
200 mg	6 mL	30/pk	12109206	12108206	12107206
500 mg	3 mL	30/pk	12109703	—	—
500 mg	6 mL	30/pk	12259506	12258506	12257506
BOND ELUT JR					
200 mg	n/a	50/pk	12169610B	—	—
MEGA BOND ELUT PLEXA					
500 mg	12 mL	20/pk	327832	—	—

Comparison of particle sizes of non-polar SPE polymers by imaging analysis



Bond Elut Plexa PCX

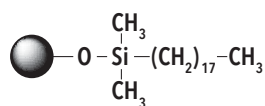


Alternative Cation Exchange Polymer



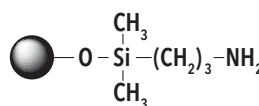
Agilent Bond Elut Reversed Phase (Non-Polar) Silica SPE

Bond Elut C18



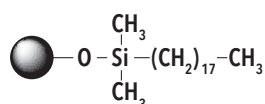
- Most hydrophobic, extremely retentive for non-polar compounds
- Effective for desalting aqueous mixtures

Bond Elut NH2



- Normal phase or anion exchange sorbent
- Weaker anion exchange than SAX

Bond Elut C18 EWP



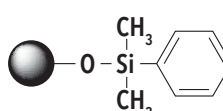
- 500Å pore size, No exclusion of large molecules
- Good for desalting proteins
- Successful separation of proteins, peptides or nucleotides

Typical Matrices

Aqueous samples, biological fluids

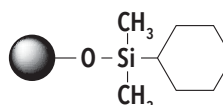
Bond Elut C18 EWP is based on standard particle size silica but with 500Å pores to allow more efficient extraction of large molecules (>15,000 MW), which are typically excluded from standard porosity silica phases.

Bond Elut Phenol



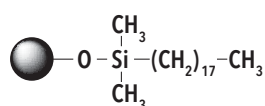
- Added selectivity compared to other non-polar sorbents
- Enhanced retention of planar, conjugated organic molecules

Bond Elut Cyclohexyl



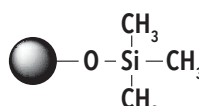
- Non-polar CH with polarity similar to C2
- Retains polar analytes from aqueous matrices

Bond Elut C18 OH



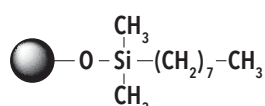
- Silanol activity permits metabolite fractionation
- Tight QC tolerances deliver batch-to-batch reproducibility

Bond Elut C1



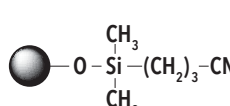
- Least retentive of all alkyl group bonded phases
- Easy retention and release of polar compounds

Bond Elut C8



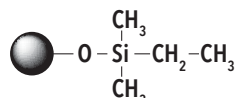
- Excellent for strongly-retained analytes
- Polar interactions not significant

Bond Elut CN-E



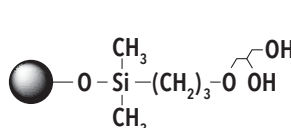
- Ideal for extracting aqueous analytes
- Retention in aqueous and organic matrices

Bond Elut C2



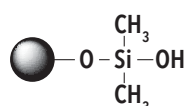
- Low carbon load sorbent
- Can be used alongside CN and C8 phases

Bond Elut Diol (20H)



- Provides polar and non-polar modes
- Strong hydrogen bonding with analytes

Bond Elut Silica



- Highly polar phase retains polar molecules from non-polar matrices
- High purity silica

Agilent Bond Elut Reversed Phase (Non-Polar) Silica SPE (cont.)

AGILENT REVERSED PHASE (NON-POLAR) SILICA SPE									
SORBENT MASS	VOLUME	QTY	C18 40 µm	C18 120 µm	C18 EWP	C18 OH 40 µm	C18 OH 120 µm	C8 40 µm	C8 120 µm
STRAIGHT BARREL CARTRIDGES									
50 mg	1 mL	100/pk	12102058	14102058	12102136	12102065	14102065	12102059	14102059
50 mg	1 mL	500/pk	12102058B	—	—	—	—	—	—
50 mg	3 mL	50/pk	12105027	—	—	—	—	12105028	—
100 mg	1 mL	100/pk	12102001	14102001	—	12102020	14102020	12102002	14102002
100 mg	1 mL	100/pk	12105102	—	—	—	—	—	—
100 mg	1 mL	500/pk	12105102B	—	—	—	—	—	—
100 mg	3 mL	40/pk	12102099	—	—	—	—	—	—
100 mg	3 mL	50/pk	—	—	—	—	—	12102100	—
100 mg	3 mL	48/pk	12105100	—	—	—	—	—	—
100 mg	6 mL	30/pk	12102161	—	—	—	—	—	—
200 mg	1 mL	100/pk	12102096	—	—	—	—	—	—
200 mg	3 mL	50/pk	12102025	14102025	12102138	162022	—	12102026	14102026
200 mg	3 mL	50/pk	12102025T	—	—	—	—	—	—
500 mg	3 mL	50/pk	12102028	14102028	12102139	12102046	14102046	12102029	14102029
500 mg	3 mL	50/pk	12105103	—	—	—	—	—	—
500 mg	3 mL	500/pk	—	14102028B	—	—	—	—	—
500 mg	6 mL	30/pk	12102052	14102052	—	—	—	12102053	14102053
500 mg	6 mL	30/pk	12102052T	—	—	—	—	—	—
500 mg	6 mL	96/pk	—	—	—	1210C18OHTC	—	—	—
500 mg	6 mL	480/pk	—	—	—	1210C18OHTCB	—	—	—
1,000 mg	3 mL	50/pk	12102118	—	—	—	—	—	—
1,000 mg	6 mL	30/pk	12256001	14256001	12256130	12256040	14256040	12256002	14256002
1,000 mg	6 mL	250/pk	12256001B	—	—	—	—	—	—
1,000 mg	60 mL	16/pk	12256060	—	—	—	—	—	—
2,000 mg	12 mL	20/pk	12256015	14256015	—	—	—	12256016	14256016
5,000 mg	20 mL	20/pk	12256023	14256023	—	—	—	12256024	14256024
10 g	60 mL	16/pk	12256031	14256031	—	—	—	12256032	14256032
96-WELL PLATES									
25 mg	1 mL, round	1/pk	A4960125	—	—	—	—	A4960325	—
25 mg	2 mL, square	1/pk	A3960125	—	—	A3962925	—	A3960325	—
50 mg	1 mL, round	1/pk	A4960950	—	—	—	—	A4960350	—
50 mg	2 mL, square	1/pk	A3960150	—	—	A3962950	—	A3960350	—
100 mg	1 mL, round	1/pk	A496011C	—	—	A496291C	—	A496031C	—
100 mg	2 mL, square	1/pk	A396011C	—	—	A396291C	—	A396031C	—
LARGE RESERVOIR CAPACITY (LRC) CARTRIDGES									
50 mg	10 mL	50/pk	—	—	12113071	—	—	—	—
100 mg	1 mL	50/pk	12113001	14113001	—	—	—	—	—
100 mg	10 mL	50/pk	12113074	—	—	—	—	12113075	—
115 mg	1 mL	50/pk	113001	—	—	—	—	—	—
200 mg	10 mL	50/pk	12113024	14113024	12113070	113004	—	12113025	—
500 mg	10 mL	50/pk	12113027	14113027	—	12113045	14113045	12113028	—
BOND ELUT JR									
500 mg	Jr	100/pk	12162028B	—	—	—	—	12162029B	—
1,000 mg	Jr	100/pk	12166001B	—	—	—	—	12166002B	—
ASPEC									
100 mg	1 mL	500/pk	22102001	—	—	—	—	—	—

120 µm Particle Size is recommended when samples will not flow through 40 µm media.

(continued on next page)

Agilent Bond Elut Reversed Phase (Non-Polar) Silica SPE (cont.)

AGILENT REVERSED PHASE (NON-POLAR) SILICA SPE								
SORBENT MASS	VOLUME	QTY	C2 40 µm	C2 120 µm	SILICA 40 µm	SILICA 120 µm	NH2 40 µm	NH2 120 µm
STRAIGHT BARREL CARTRIDGES								
50 mg	1 mL	100/pk	12102060	14102060	12102068	14102068	12102076	14102076
50 mg	3 mL	50/pk	12105029	—	—	—	—	—
100 mg	1 mL	100/pk	12102003	14102003	12102010	14102010	12102014	—
100 mg	3 mL	50/pk	12102117	—	12102128	—	—	—
200 mg	3 mL	50/pk	12102027	14102027	102001	—	12102089	—
200 mg	6 mL	30/pk	—	—	—	—	12102106	—
200 mg	20 mL	20/pk	—	—	12102147	—	—	—
300 mg	3 mL	50/pk	—	—	—	—	12102108	—
500 mg	3 mL	50/pk	12102030	—	12102037	14102037	12102041	—
500 mg	6 mL	30/pk	12102115	—	102002	—	12256045	—
500 mg	6 mL Tabless	500/pk	—	—	1247232	—	—	—
500 mg	12 mL	20/pk	—	—	—	—	12102160	—
1,000 mg	3 mL	50/pk	—	—	207236	—	12102107	—
1,000 mg	6 mL	30/pk	12256003	14256003	12256008	14256008	12256012	14256012
1,000 mg	6 mL	250/pk	—	—	12256008B	—	12256012J	—
1,500 mg	3 mL	50/pk	—	—	12102119	—	—	—
2,000 mg	6 mL	30/pk	—	—	227138	—	—	—
2,000 mg	12 mL	20/pk	12256056	—	12256018	14256018	12256020	14256020
5,000 mg	20 mL	20/pk	—	—	12256026	14256026	—	—
10 g	60 mL	16/pk	—	—	12256034	14256034	12256036	14256036
96-WELL PLATES								
25 mg	1 mL, round	1/pk	—	—	—	—	A4960525	—
25 mg	2 mL, square	1/pk	—	—	—	—	A3960525	—
50 mg	1 mL, round	1/pk	A4961150	—	—	—	A4960550	—
50 mg	2 mL, square	1/pk	—	—	—	—	A3960550	—
100 mg	1 mL, round	1/pk	A496111C	—	—	—	A496051C	—
100 mg	2 mL, square	1/pk	—	—	—	—	A396051C	—
LARGE RESERVOIR CAPACITY (LRC) CARTRIDGES								
50 mg	10 mL	50/pk	—	—	—	—	—	14113040
100 mg	1 mL	50/pk	—	—	—	14113010	12113014	—
100 mg	10 mL	50/pk	12113003	—	—	12113010	—	—
200 mg	10 mL	50/pk	—	—	—	—	12113067	—
500 mg	10 mL	50/pk	—	—	12113036	—	12113040	—
500 mg	10 mL	100/pk	12113029	—	—	—	—	—
BOND ELUT JR								
500 mg	Jr	100/pk	—	—	12162037B	—	12162041B	—
1,000 mg	Jr	100/pk	—	—	12166008B	—	12166012B	—

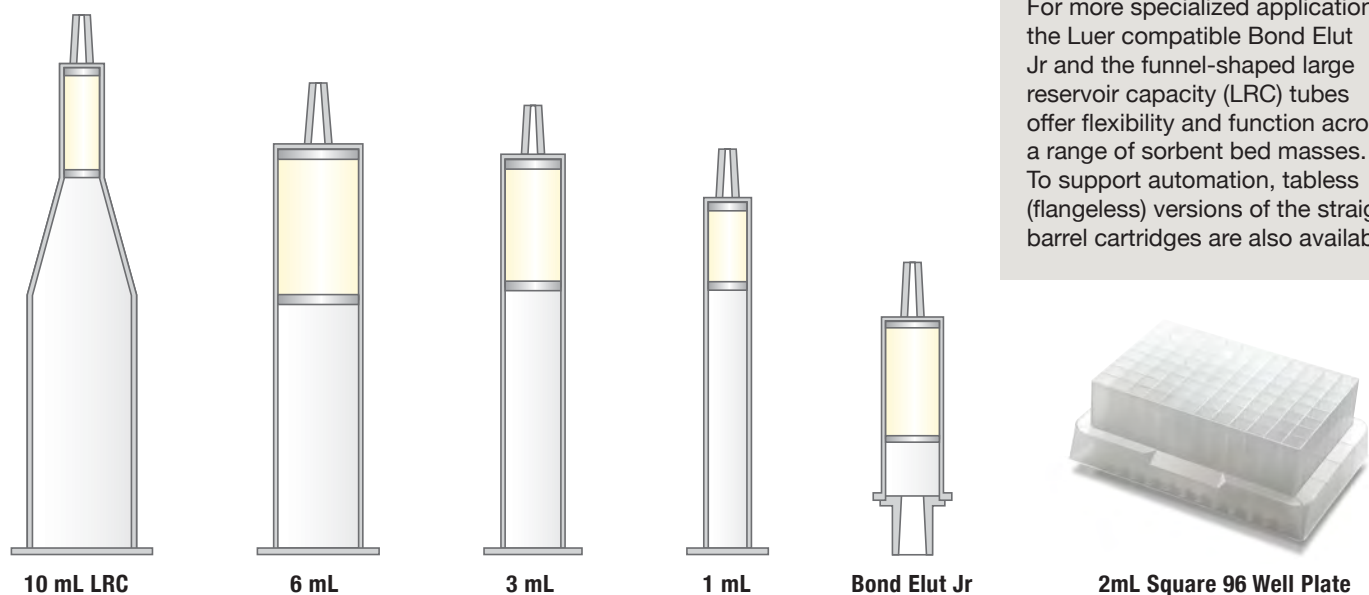
120 µm Particle Size is recommended when samples will not flow through 40 µm media.

(continued on next page)

Agilent Bond Elut Reversed Phase (Non-Polar) Silica SPE (cont.)

AGILENT REVERSED PHASE (NON-POLAR) SILICA SPE								
SORBENT MASS	VOLUME	QTY	PHENOL 40 μm	PHENOL 120 μm	CYCLOHEXYL	C1	CN-E	D10L (20H)
STRAIGHT BARREL CARTRIDGES								
50 mg	1 mL	100/pk	12102062	14102062	—	—	12102064	12102067
50 mg	3 mL	50/pk	—	—	12102033	—	—	—
100 mg	1 mL	100/pk	12102005	14102005	—	12102004	12102007	12102009
100 mg	1 mL Tabless	100/pk	—	—	—	—	12102007T	—
100 mg	3 mL	50/pk	—	—	—	12102090	—	—
500 mg	3 mL	50/pk	12102032	14102032	—	12102031	—	12102036
500 mg	3 mL	500/pk	—	—	—	—	12102034	—
1,000 mg	6 mL	30/pk	12256004	14256004	12256005	—	—	12256007
2,000 mg	12 mL	20/pk	—	—	12256039	—	—	—
96-WELL PLATES								
25 mg	1 mL, round	1/pk	—	—	A4962225	—	A4960425	—
25 mg	2 mL, square	1/pk	A3961525	—	—	—	—	—
50 mg	1 mL, round	1/pk	—	—	A4962250	—	A4960450	—
50 mg	2 mL, square	1/pk	A3961550	—	—	—	—	—
100 mg	1 mL, round	1/pk	A496151C	—	A496221C	—	A496041C	—
100 mg	2 mL, square	1/pk	A396151C	—	—	—	—	—
LARGE RESERVOIR CAPACITY (LRC) CARTRIDGES								
50 mg	10 mL	50/pk	—	—	12113032	—	—	—
100 mg	1 mL	50/pk	—	14113005	—	—	—	12113009
100 mg	10 mL	50/pk	12113005	—	—	—	—	—
500 mg	10 mL	50/pk	12113031	—	—	—	12113033	12113035

120 μm Particle Size is recommended when samples will not flow through 40 μm media.

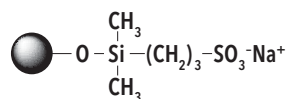


TECH TIP

For more specialized applications, the Luer compatible Bond Elut Jr and the funnel-shaped large reservoir capacity (LRC) tubes offer flexibility and function across a range of sorbent bed masses. To support automation, tabless (flangeless) versions of the straight-barrel cartridges are also available.

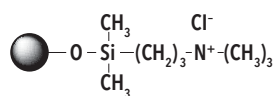
Agilent Bond Elut Ion Exchange Silica SPE

Bond Elut PRS



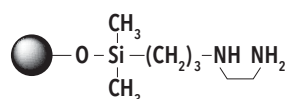
- ➔ Strong cation exchange sorbent, also capable of polar and hydrogen bonding interactions
- ➔ No appreciable non-polar interactions

Bond Elut SAX



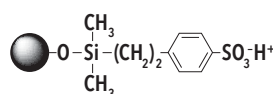
- ➔ Retains compounds that elute from weak anion exchange sorbents
- ➔ Selectivity can be user-modified for increased flexibility

Bond Elut PSA



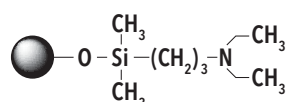
- ➔ Alternative choice to Bond Elut NH2 for polar compounds
- ➔ Higher ionic capacity than NH2

Bond Elut SCX



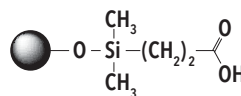
- ➔ Useful for compounds with both cationic and non-polar characteristics
- ➔ Superior cleanup from a single sorbent

Bond Elut DEA



- ➔ Weak anion exchanger
- ➔ More polar than C8 but less polar than C2 or CN

Bond Elut CBA



- ➔ Cation exchange with no need for extreme basic conditions
- ➔ Wider selectivity range provides more eluent options

AGILENT ION EXCHANGE SILICA SPE

SORBENT MASS	VOLUME	QTY	PRS	PSA 40 μm	PSA 120 μm	DEA 40 μm	DEA 120 μm
STRAIGHT BARREL CARTRIDGES							
50 mg	1 mL	100/pk	12102074	—	14102077	12102078	14102078
100 mg	1 mL	100/pk	12102012	—	—	12102016	14102016
100 mg	3 mL	50/pk	—	—	—	12102142	—
200 mg	3 mL	50/pk	—	—	—	102019	—
200 mg	3 mL	100/pk	12102094	—	—	—	—
500 mg	3 mL	50/pk	12102039	12102042	14102042	12102043	14102043
500 mg	6 mL	30/pk	12102086	—	—	—	—
500 mg	6 mL	50/pk	—	12105042	—	—	—
1,000 mg	6 mL	30/pk	12256010	12256140	—	—	—
2,000 mg	12 mL	20/pk	—	12256055	—	—	—
3,000 mg	6 mL	30/pk	—	12105044	—	—	—
10 g	60 mL	16/pk	—	12256041	—	—	—
LARGE RESERVOIR CAPACITY (LRC) CARTRIDGES							
100 mg	1 mL	50/pk	—	—	—	12113016	—
100 mg	10 mL	50/pk	12113012	—	—	—	—
500 mg	10 mL	50/pk	12113038	12113041	14113041	12113042	14113042
BOND ELUT JR							
500 mg	Jr	100/pk	—	12162042B	—	—	—
1,000 mg	Jr	100/pk	—	12166050B	—	12166046B	—

120 μm Particle Size is recommended when samples will not flow through 40 μm media.

(continued on next page)

Agilent Bond Elut Ion Exchange Silica SPE (cont.)

AGILENT ION EXCHANGE SILICA SPE								
SORBENT MASS	VOLUME	QTY	SAX 40 µm	SAX 120 µm	SCX 40 µm	SCX 120 µm	CBA 40 µm	CBA 120 µm
STRAIGHT BARREL CARTRIDGES								
50 mg	1 mL	100/pk	12102079	14102079	12102075	14102075	12102073	14102073
100 mg	1 mL	100/pk	12102017	14102017	12102013	14102013	12102011	14102011
100 mg	1 mL Tableless	100/pk	12102017T	—	—	—	—	—
100 mg	1 mL Tableless	500/pk	12102017TB	—	—	—	—	—
100 mg	3 mL	50/pk	12102125	—	12102098	14102021	12102097	—
100 mg	6 mL	30/pk	12102165	—	—	—	—	—
200 mg	3 mL	50/pk	12102126	—	102118	—	12102124	—
300 mg	3 mL	50/pk	—	—	102018	—	—	—
500 mg	3 mL	50/pk	12102044	14102044	12102040	14102040	12102038	—
500 mg	3 mL Tableless	50/pk	12102044T	—	—	—	—	—
500 mg	6 mL	30/pk	12102144	—	102014	14102094	102004	—
500 mg	6 mL	50/pk	—	—	—	—	—	—
1,000 mg	3 mL	50/pk	12102087	—	—	—	—	—
1,000 mg	6 mL	30/pk	12256013	14256013	12256011	14256011	12256009	14256009
1,000 mg	6 mL Tableless	30/pk	—	—	12256088	—	—	—
1,500 mg	3 mL	50/pk	12102103	—	—	—	—	—
2,000 mg	6 mL	30/pk	12256051	—	12256053	—	—	—
2,000 mg	12 mL	20/pk	12256021	14256021	12256019	14256019	12256058	—
3,000 mg	6 mL	30/pk	—	—	12256054	—	—	—
5,000 mg	20 mL	20/pk	12256029	14256029	12256027	14256027	—	—
5,000 mg	60 mL	16/pk	1225SAX6015G	—	—	—	—	—
10 g	60 mL	16/pk	12256037	—	12256035	14256035	—	—
20 g	60 mL	16/pk	—	—	12256065	—	—	—
30 g	60 mL	16/pk	—	—	12256064	—	—	—
96-WELL PLATES								
25 mg	1 mL, round	1/pk	A4963025	—	A4960725	—	A4960625	—
25 mg	2 mL, square	1/pk	A3960825	—	A3960725	—	A3960625	—
50 mg	1 mL, round	1/pk	A4963050	—	A4960750	—	A4960650	—
50 mg	2 mL, square	1/pk	A3960850	—	A3960750	—	A3960650	—
100 mg	1 mL, round	1/pk	A496301C	—	A496071C	—	A496061C	—
100 mg	2 mL, square	1/pk	A396081C	—	A396071C	—	A396061C	—
LARGE RESERVOIR CAPACITY (LRC) CARTRIDGES								
50 mg	10 mL	50/pk	—	14113043	—	—	—	—
100 mg	1 mL	50/pk	12113017	—	—	—	—	—
100 mg	10 mL	50/pk	—	—	12113013	—	—	—
100 mg	10 mL	500/pk	—	—	12113013B	—	—	—
200 mg	10 mL	50/pk	—	—	—	—	12113079	—
500 mg	10 mL	50/pk	12113043	—	12113039	14113039	12113037	—
BOND ELUT JR								
500 mg	Jr	100/pk	12162044B	—	12162040B 12167001B	—	—	—
1,000 mg	Jr	100/pk	12166013B	—	12166011B	—	—	—
ASPEC								
100 mg	1 mL	500/pk	22102017	—	—	—	—	—

120 µm Particle Size is recommended when samples will not flow through 40 µm media.

Agilent Bond Elut Ion Mixed Mode Silica SPE

Bond Elut AccuCAT	Bond Elut Certify	Bond Elut Certify II
→ SCX and SAX functionalities offer broad analyte extraction potential	→ Mixed Mode, C8 and SCX	→ Mixed Mode, C8 and SAX
→ Ultra clean, mixed sorbent bed delivers reproducible extractions	→ Most commonly used to extract basic drugs from urine and blood	→ Most commonly used to extract acidic drugs from urine and blood

AGILENT MIXED MODE SILICA SPE							
SORBENT MASS	VOLUME	QTY	AccuCAT	CERTIFY 40 µm	CERTIFY 120 µm	CERTIFY II 40 µm	CERTIFY II 120 µm
STRAIGHT BARREL CARTRIDGES							
50 mg	1 mL	100/pk	—	12102000	—	—	—
50 mg	3 mL	50/pk	—	12105030	—	12105031	—
100 mg	1 mL	100/pk	—	—	—	102818C	—
130 mg	1 mL	100/pk	—	12102083	14102083	—	—
130 mg	3 mL	50/pk	—	12102051	14102051	—	—
130 mg	3 mL Tabless	50/pk	—	12102051T	—	—	—
130 mg	6 mL	30/pk	—	12256146	—	—	—
130 mg	6 mL Tabless	500/pk	—	12256146TJ	—	—	—
180 mg	3 mL	50/pk	—	—	14103002	—	—
200 mg	3 mL	50/pk	—	12102145	—	12102080	14102080
200 mg	3 mL	60/pk	12282003	—	—	—	—
200 mg	6 mL	30/pk	12282004	12256145	—	12102152	—
300 mg	3 mL	50/pk	—	12102081	14102081	—	—
300 mg	3 mL Tabless	50/pk	—	12102081T	14102081T	—	—
300 mg	6 mL	30/pk	—	12102082	14102082	—	—
400 mg	6 mL	30/pk	12282006	—	—	—	—
500 mg	3 mL	50/pk	—	12102156	—	—	—
500 mg	6 mL	30/pk	—	12102093	14102093	12102084	14102084
600 mg	3 mL	60/pk	12282002	—	—	—	—
1,000 mg	6 mL	30/pk	—	12102085	14102085	12102088	14102088
96-WELL PLATES							
25 mg	1 mL, round	1/pk	—	A4960925	—	—	—
25 mg	2 mL, square	1/pk	—	A3960925	—	—	—
50 mg	1 mL, round	1/pk	—	A4960950	—	—	—
50 mg	2 mL, square	1/pk	—	A3960950	—	—	—
100 mg	1 mL, round	1/pk	—	A496091C	—	—	—
100 mg	2 mL, square	1/pk	—	A396091C	—	—	—
LARGE RESERVOIR CAPACITY (LRC) CARTRIDGES							
75 mg	1 mL	50/pk	—	—	—	12113064	—
100 mg	1 mL	50/pk	—	—	—	12113063	—
130 mg	10 mL	50/pk	—	12113050	14113050	—	—
130 mg	10 mL	500/pk	—	12113055	14113055	—	—
200 mg	10 mL	50/pk	—	12113054	14113054	12113051	14113051
200 mg	10 mL	60/pk	12282005	—	—	—	—
300 mg	10 mL	50/pk	—	12113052	14113052	—	—
600 mg	10 mL	60/pk	12282001	—	—	—	—
ASPEC							
130 mg	3 mL	500/pk	—	22102084	—	—	—

120 µm Particle Size is recommended when samples will not flow through 40 µm media.

Agilent Bond Elut Inorganic SPE

Bond Elut Florisil

- ➔ Pesticide Residue (PR) grade
- ➔ For cleanup of polar interferences from non-polar samples
- ➔ Economical

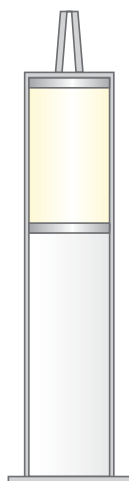
Bond Elut Alumina

- ➔ Available in acidic (A), basic (B) and neutral (N) formats
- ➔ High extraction efficiency
- ➔ Better high pH stability than unfunctionalized silica

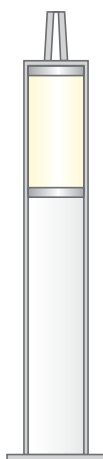
AGILENT INORGANIC SPE						
SORBENT MASS	VOLUME	QTY	FLORISIL	ALUMINA A	ALUMINA B	ALUMINA N
STRAIGHT BARREL CARTRIDGES						
50 mg	1 mL	100/pk	12102072	12102069	12102070	12102071
100 mg	1 mL	100/pk	12102024	—	12102022	12102023
200 mg	1 mL	100/pk	—	12102133	—	—
200 mg	3 mL	50/pk	12102129	—	—	—
500 mg	3 mL	50/pk	12102050	12102047	12102048	12102049
500 mg	6 mL	30/pk	12102159	—	—	—
500 mg	6 mL	1,000/pk	—	—	—	221032B
1,000 mg	3 mL	50/pk	12102109	—	—	—
1,000 mg	6 mL	30/pk	12256014	12256043	12256044	12256086
1,000 mg	20 mL	20/pk	12256047	—	—	—
2,000 mg	12 mL	20/pk	12256022	—	—	—
2,000 mg	20 mL	20/pk	12256046	—	—	—
5,000 mg	20 mL	20/pk	12256030	—	—	—
10 g	60 mL	16/pk	12256038	—	—	12256050
20 g	60 mL	16/pk	—	—	—	12256059
LARGE RESERVOIR CAPACITY (LRC) CARTRIDGES						
500 mg	10 mL	50/pk	12113049	12113046	—	12113048
BOND ELUT JR						
500 mg	Jr	100/pk	12162050B	—	12162048B	12162049B
1,000 mg	Jr	100/pk	12166014B	12166043B	12166044B	12166045B



10 mL LRC



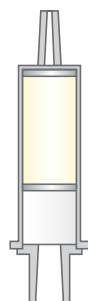
6 mL



3 mL



1 mL



Bond Elut Jr



2mL Square 96 Well Plate

Agilent Specialty SPE

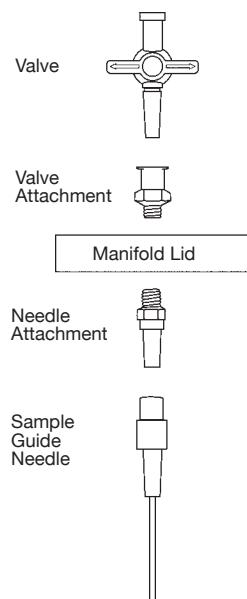
Bond Elut Carbon	Bond Elut Cellulose	Bond Elut PCB
<ul style="list-style-type: none"> → Excellent retention for small organics, including those that are too polar to retain on C18 or polymeric SPE → Removal of chlorophyll and other pigments leads to fewer chromatographic or mass interferences 	<ul style="list-style-type: none"> → High purity micro-granular cellulose with high α-cellulose content → Stable across a broad pH range 	<ul style="list-style-type: none"> → Optimized bed mass affords excellent extraction reproducibility → Special dual-phase enhances PCB selectivity
Bond Elut Mycotoxin	Bond Elut PBA	Bond Elut EnvirElut
<ul style="list-style-type: none"> → Simple methodology saves time and increases throughput → Use with a broad range of food matrices 	<ul style="list-style-type: none"> → Unique phenylboronic acid sorbent → High specificity for cis-diol compounds 	<ul style="list-style-type: none"> → Extreme purity offers cleanliness in extract → High capacity allows for the processing of large sample volumes

AGILENT SPECIALTY SPE										
SORBENT MASS	VOLUME	QTY	CARBON	CARBON/NH ₂	CARBON/PSA	CELLULOSE	PCB	MYCOTOXIN	PBA	EnvirElut
STRAIGHT BARREL CARTRIDGES										
50 mg	1 mL	100/pk	126414	—	—	—	—	—	—	—
100 mg	1 mL	20/pk	—	—	—	—	—	—	12102018	—
100 mg	1 mL	100/pk	126418	—	—	—	—	—	12102019	—
100 mg	3 mL	50/pk	—	—	—	—	—	—	12102127	—
250 mg/250 mg	3 mL	50/pk	—	—	12102042C250	—	—	—	—	—
250 mg	6 mL	30/pk	12102201	—	—	—	—	—	—	—
300 mg	3 mL	50/pk	—	—	—	168726	—	—	—	—
300 mg	3 mL	500/pk	—	—	—	12102095	—	—	—	—
500 mg	3 mL	50/pk	—	—	—	—	—	12102167	—	—
500 mg	6 mL	30/pk	12252201	2264265032	—	—	—	—	12102105	—
500 mg/500 mg	6 mL	30/pk	—	12252202	12102042C500	—	—	—	—	—
500 mg/500 mg	20 mL	20/pk	—	3664325032	—	—	—	—	—	—
1,000 mg	6 mL	30/pk	—	—	—	—	—	—	—	12272005 (PAH)
5,000 mg	20 mL	20/pk	—	—	—	—	—	—	—	12272001 (oil + grease) 12272020 (US EPA 1664)
96-WELL PLATES										
25 mg	1 mL, round	1/pk	—	—	—	—	—	—	A496121C	—
25 mg	2 mL, square	1/pk	—	—	—	—	—	—	A396121C	—
BOND ELUT JR										
500 mg	Jr	100/pk	—	—	—	—	—	12165001B	—	—
LARGE RESERVOIR CAPACITY (LRC) CARTRIDGES										
100 mg	10 mL	50/pk	—	—	—	—	—	—	12113018	—
1,000 mg	3 mL	50/pk	—	—	—	—	12105032	—	—	—

12- or 24-Port SPE Vacuum Manifolds

- ➔ Use with any standard male luer end SPE cartridges
- ➔ Inert, PTFE sample guides reduce cross-contamination and carryover
- ➔ Flexible sample collection rack will accommodate a variety of receiving vessels
- ➔ Quick vacuum-release valve for better system control
- ➔ Individual valves allow vacuum control for each cartridge, improving reproducibility

SPE VACUUM MANIFOLDS		
DESCRIPTION	QTY	PART NO
Complete SPE Manifold, 12-Port (Includes: glass basin with built-in vacuum regulator, polypropylene lid with 12 individual control valves, 12 position collection rack, 12 PTFE sample guides, and waste container).	kit	VM12-SYS
Complete SPE Manifold, 24-Port (Includes: glass basin with built-in vacuum regulator, polypropylene lid with 24 individual control valve, 24-position collection rack, and 24 PTFE sample guides).	kit	VM24-SYS
VACUUM MANIFOLD REPLACEMENT PARTS		
Replacement Waste Container, 12-Port	ea	VM12-01
Replacement Vacuum Valve and Gauge Assembly	ea	VM-02
Glass Vacuum Chamber w/gauge & valve, 12 or 24-Port	ea	VM-03
Collection Rack, 12-Port	ea	VM12-04
Collection Rack, 24-Port	ea	VM24-04
Replacement Manifold Lid (sample guides not included), 12-Port	ea	VM12-05
Replacement Manifold Lid (sample guides not included), 24-Port	ea	VM24-05
Replacement Manifold Valves, 12 or 24-Port	2/pk	VM-06
Replacement Manifold Valve Attachment, 12 or 24-Port	48/pk	VM-07
Replacement Manifold Needle Attachment, 12 or 24-Port	48/pk	VM-08
Sample Guide Needles, 12 or 24-Port	12/pk	VM-09



Waste container (shown in tank) and top shelf for round-bottom flasks are not included in 24-port manifold kit (VM24-SYS)



VM12-SYS



Waste container (shown in tank)

SPE TUBE PARTS & ACCESSORIES										
VOLUME	EMPTY TUBES (POLYPROPYLENE)		FRITS (POLYETHYLENE), 20µm		TUBE CAPS (POLYETHYLENE)		FEMALE LUER END CAPS (POLYPROPYLENE)		CONNECTORS	
	QTY	PART NO	QTY	PART NO	QTY	PART NO	QTY	PART NO	QTY	PART NO
1 mL	50/pk	SPT-01	100/pk	SPF-0120	12/pk	SPC-01	12/pk	SPC-FL	12/pk	SPC-CON01
3 mL	50/pk	SPT-03	100/pk	SPF-0320	12/pk	SPC-03	12/pk	SPC-FL	12/pk	SPC-CON01
6 mL	50/pk	SPT-06	100/pk	SPF-0620	12/pk	SPC-06	12/pk	SPC-FL	12/pk	SPC-CON01
15 mL	50/pk	SPT-15	100/pk	SPF-1520	12/pk	SPC-15	12/pk	SPC-FL	12/pk	SPC-CON15
25 mL	12/pk	SPT-25	100/pk	SPF-2520	12/pk	SPC-25	12/pk	SPC-FL	12/pk	SPC-CON15
60 mL	12/pk	SPT-60	100/pk	SPF-6020					12/pk	SPC-CON60



Cerex Positive Pressure Processor for Sample Preparation

- ➔ Positive Pressure manifold provides uniform flow for all extraction steps
- ➔ All positions are individually restricted to provide even pressure to each column. Even flow can be maintained if you are using one, some, or all positions

CEREX® SYSTEM 48-II

PART NO	DESCRIPTION
289-0004	Cerex System 48-II Positive Pressure Processor
CHOOSE 1 SPE RACK	
279-0021	SPE rack to fit 1 cc cartridges
279-0022	SPE rack to fit 3 cc cartridges
279-0023	SPE rack to fit 6 cc cartridges
CHOOSE 1 COLLECTION RACK	
279-0015	Collection rack to fit 12 x 75 mm tubes
279-0016	Collection rack to fit 13 x 100 mm tubes
279-0017	Collection rack to fit 16 x 100 mm tubes
279-0018	Collection rack to fit 12 x 32 mm autosampler
279-0020	Collection rack to fit 16 x 125 mm, 10 mL centrifuge tubes
ADD-ON OPTION	
289-1000	Manifold Heater Option to 50 °C
REPLACEMENT PARTS	
279-0009	Waste Bin (3/pk)
279-0010	Gas Supply Adapter, includes 1/8" – 1/4" NPT Fitting, 6 ft of 1/4" tubing
279-0012	Manifold Replacement Gasket

CEREX® SYSTEM 96

PART NO	DESCRIPTION
288-0001	Cerex System 96 Processor
OPTION	
288-1000	Heated Manifold Option for System 96 Pressure Processor
REPLACEMENT COMPONENT	
278-0035	Column Seal for 96-Place Systems, Removable

Includes 1 waste bin, 3 waste bin inserts, gas supply adapter and 48-place sealing gasket. SPE rack and collection rack must be ordered separately.

Cerex Concentrator 48

- ➔ Single rack for SPE elution and evaporation eliminates time consuming transfers and misplacement of samples

CEREX CONCENTRATOR 48

PART NO	DESCRIPTION
279-0050	CEREX Concentrator 48, includes one collection rack
ACCESSORIES	
279-3024	Concentrator Ventilator Assembly

See Cerex 48-II collection rack ordering information above for options)



Visit our website at www.chromtech.com for more detailed product information



System 48-II

The quick-change multi-rack option provides flexibility in extraction tube sizes of 1, 3, 5, and 20 mL.



System 96

Self-adjusts to any plate height—accommodates all commercial 96-well plates.

TECH TIP

The optional heated manifold provides for rapid and thorough cartridge/well drying.



Concentrator 48

The CEREX 48 Concentrator is a 48-place evaporator that provides high throughput processing of sample extracts when used in conjunction with a 48-Place Positive Pressure Processor.

Chrom Tech Evaporator/Concentrator

- ➔ Low cost solution for the concentration of samples
- ➔ Each stainless steel (SS) needle delivers an equal flow of nitrogen or other gas
- ➔ Digital temp control heats gas and aluminum block insert up to 100 °C
- ➔ Manifolds and blocks are easily interchanged for added flexibility
- ➔ Flow readout and needle valve flow control

Chrom Tech's evaporator/concentrator rapidly evaporates samples by heating both the gas line and the aluminum block. Replacement manifolds and aluminum blocks may be purchased to allow for a variety of sample containers to be used. Fewer numbers of samples are easily accommodated by plugging any position so that any number of samples may be evaporated or concentrated. The manifolds come with removable stainless steel luer hub needles.



CHROM TECH HEATED EVAPORATOR/CONCENTRATOR			
COMPLETE ASSEMBLY	REPLACEMENT MANIFOLD ONLY	MANIFOLD	ALUMINUM BLOCK FITS:
11-80025	11-80020A	2 position	Up to 61 mm diameter
11-80085	11-80080A	8 position	Up to 28 mm diameter
11-80125	11-80120A	12 position	Up to 18 mm diameter
11-80205	11-80200A	20 position	Up to 15 mm diameter
11-80245	11-80240A	24 position	Up to 15 mm diameter
11-80485	11-80480A	48 position	Up to 12 mm diameter
11-80965	11-80960A	96 position (well plate)	Fits one 96 well plate
11-83845	11-83840A	384 position	Fits one 384 well plate

CHROM TECH REPLACEMENT ALUMINUM BLOCKS		
PART NO	FITS MANIFOLD:	ALUMINUM BLOCK FITS:
12-70022	2 position	Up to 61 mm diameter
12-70082	8 position	Up to 28 mm diameter
12-70122	12 position	Up to 22 mm diameter
12-70202	20 position	Up to 15 mm diameter
12-70243	24 position	Up to 15 mm diameter
12-70242	24 position	Up to 12 mm diameter
12-70248SP	24 position	Up to 8 mm diameter
12-70482	48 position	Up to 12 mm diameter
12-70483	48 position	Up to 8 mm diameter
12-70484	48 position	Up to 6 mm diameter

CHROM TECH HEATED EVAPORATOR/CONCENTRATOR ACCESSORIES	
PART NO	DESCRIPTION
12-71001	Red nylon luer plugs, 10/pk
12-70001	Replacement SS needles, 1.5" x 16 ga, 50/pk w/black poly hubs
12-70002	Replacement SS needles, 1.5" x 16 ga, 25/pk w/black poly hubs

TECH TIP

Looking for an aluminum block to fit a different diameter vial?



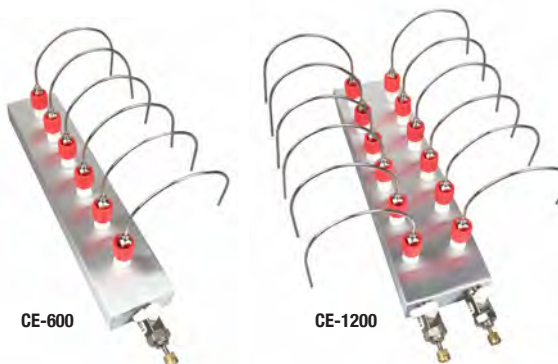
Contact Chrom Tech Support Desk

for a custom block quote—support@chromtech.com

BarVap Evaporator/Concentrator

BARVAP EVAPORATOR/CONCENTRATOR	
PART NO	DESCRIPTION
CE-1200	12 Position concentrator/evaporator
CE-600	6 Position concentrator/evaporator
CE-1301	Vial rack 13mm
CE-1601	Vial rack 16mm
SPARE PARTS	
CE-6001	4" SS luer needle, 6/pk
CE-6002	Spare luer lock adapters, 6/pk
CE-6005	Acrylic tubing, 3 feet

- ➔ Nickel plated to resist solvents
- ➔ Needle valve for fine control of gas flow
- ➔ Stainless Steel needles



Porvair Evaporators

Decrease Evaporation Time—Heated Nitrogen Just Above Liquid Level

The evaporators are designed to remove the traditional laboratory ‘bottleneck’ of solvent evaporation from microplates. Warm nitrogen gas is blown down into the wells of the microplate, just above the liquid level. The effect is to speed up solvent evaporation by providing more energy for evaporation. This enables equilibrium to be reached more quickly, leading to faster drying.

Most common chromatography solvents can be evaporated with ease, including dichloromethane, methanol, acetonitrile and hexane. The nitrogen blow-down method is not, however, suitable for high-boiling point solvents such as DMF, DMSO and water. It is not recommended for use with acids or acid chlorides, as special corrosion-resistant systems are needed for this work. The choice of straight or spiral needles allows the user to choose between faster dry down (spiral) and better final drying in V-well plates (straight). The spirals cause a vortex to form in the solvent, increasing the surface area and thus speeding up the rate of evaporation. Spiral needles are only suitable for use with square-well plates and larger vials.



PORVAIR EVAPORATORS

MINIVAP™

ULTRAVAP LEVANTE™

ULTRAVAP MISTRAL™



MiniVap Gemini



- Manual control of the needle depth, gas temperature, and flow rate
- Changeable head to accommodate 24, 48, 96 straight or 96 spiral needles
- The Gemini has two individually temperature regulated evaporation positions



The MiniVap has a single plate position

- Five password protected methods
- Each method has up to three timed stages
- Each timed stage controls:
 - Gas temperature
 - Gas flow rate
 - Needle depth
- Optional duct adapter for fume management

- 15 password protected methods
- Each method has up to five timed stages
- Each timed stage controls:
 - Gas temperature
 - Gas flow rate
 - Needle depth
- Robot Compatible
- Shuttle sends/retrieves plates from robot deck
- Built-in duct adapter for fume management

SPECIFICATIONS				
	ULTRAVAP MISTRAL	ULTRAVAP LEVANTE	MINIVAP	MINIVAP GEMINI
Voltage	110 V or 220 V auto ranging power supply			
Max Current	10 A			
Heaters	Ambient to 60 °C			
Heater Setting	Via software from ambient to 60 °C	VIA TK-32 programmers		VIA TK-32 programmers (2)
Evaporation Heads	Interchangeable 24, 48, 96 straight or 96 spiral, 384 needles		Interchangeable 24, 48, 96 straight or 96 spiral needles	
Gas Inlet	8 mm ID QuickConnect			
Gas Pressure	Minimum 45 PSI (3 bar), Maximum 100 PSI (7 bar)			
Gas Control	Digital flow rate settings via onboard software on touchscreen	Needle valve control	Two independent needle valve controls	
Gas Flow Rate	Min 5 L/min, heaters inactive below 35 L/min, max flow 80 L/min	Heaters inactive below 35 L/min flow rate, max flow 70 L/min PER HEAD		
Gas Requirements	Supply at 45 – 100 PSI (3 – 7 bar) and up to 80 L/min	Supply at 45 – 100 PSI (3 – 7 bar) and up to 160 L/min	Supply at 45 – 100 PSI (3 – 7 bar) and up to 160 L/min (both heads)	
Vertical Travel	55 mm plate height			
Plate Adjustment	Programmable in either 3 (Levante) or 5 (Mistral) stages	Height adjustment of one plate	Simultaneous height adjustment of both plates	
Plate Locators	Standard SLAS/ANSI plate nest	One plate, adjustable	Two sets, individually adjustable	

System requirements: Optimal gas supply is 70 L/min at 87 PSI (6 bar). The Ultravap models have a built in digital gas flow meter that controls the flow rate and switches off the heaters if the gas supply drops below 30 L/min for maximum safety. Between 5 and 30 L/min, the Ultravap may be operated without heating using gas at input temperature only. Similarly, if the pressure exceeds 7 bar, safety valves will shut down the system to prevent damage.

EVAPORATOR FEATURES	MISTRAL	LEVANTE	MINIVAP	MINIVAP GEMINI
Automation compatible	●	●		
Adjustable plate shuttle	●			
Full-color touch screen graphic displays	●	●		
Remote control from PC	●	●		
Real-time run displays	●	●		
Changeable head	●	●	●	●
Built-in fume management	●	●		
Process two plates simultaneously				●
Duct connector	●	OPTIONAL		
Stored evaporation programs	15	5	N/A	N/A
Programmable steps per method	5	3	N/A	N/A

TECH TIP

For the full line of 96-well plates

Contact Chrom Tech Support Desk for a quote—
support@chromtech.com



PORVAIR EVAPORATORS & ACCESSORIES				
ULTRAVAP MISTRAL	ULTRAVAP LEVANTE	MINIVAP	MINIVAP GEMINI	DESCRIPTION
500147	500224	229201	500232	Evaporator with 96 spiral needles
500148	500225	229200	500233	Evaporator with 96 straight needles
500149	500226	229206	500234	Evaporator without a head (head required, sold separately)
500193	—	—	—	Mistral CAN bus interface cable with RS232 initiator and CAN terminator plugs
Included	500194	—	—	Duct Adapter/Fume extractor fan complete plug-in assy with housing

ACCESSORIES & SPARES FOR ULTRAVAP & MINIVAP EVAPORATORS	
229072	96 Needle Head with spiral needles
229036	96 Needle Head with straight needles
229073	384 Needle Head with straight needles (for Ultravap models only)
229410	48 Needle Head with straight needles for use with HPLC vials (vial adapter required, 500109)
500109	48 Position Vial Adapter, fits 12 x 32 mm vials (2 mL)
229409	24 Needle Head with straight needles
229048	Gasket for needle manifold

HPLC Columns

Agilent for Small Molecule	60	Hamilton	106
InfinityLab Poroshell 120	60	Reversed-Phase	106
ZORBAX Eclipse Plus	62	Anion Exchange	110
ZORBAX Eclipse XDB	64	Cation Exchange	114
ZORBAX 80Å StableBond	66	Ion Exclusion	117
ZORBAX 80Å Extend-C18	70	Imtakt	118
ZORBAX Bonus-RP	72	Presto FF-C18	118
ZORBAX Eclipse PAH	74	Cadenza CD-C18	119
ZORBAX HILIC Plus	74	Intrada Amino Acids Separation	120
ZORBAX NH2	74	Scherzo C18 Mutli-Mode	121
ZORBAX Rx	75	Jordi	122
Pursuit XRs	75	Jordi Resolve Organic GPC	122
Polaris	76	Jordi Resolve Aqueous GPC	124
Agilent BioHPLC	78	Perkin Elmer Brownlee	125
Poroshell 300	78	Regis	126
AdvanceBio RP-mAb	78	Regis Pirkle Chiral Columns	126
AdvanceBio Glycan Mapping	79	Immobilized Artificial Chromatography	128
InfinityLab Poroshell 120	79	Restek	130
AdvanceBio Peptide Mapping		Raptor™	130
PLRP-S	80	Ultra HPLC	134
Zorbax 300Å StableBond	81	Force	136
AdvanceBio SEC	82	Roc®	137
ProSEC 300S	82	Millipore Sigma	138
Bio SEC-3	83	Ascentis Express	138
Bio SEC-5	83	Chromalith® RP-18 endcapped	139
ProSEC 300S	82	Thermo Scientific	140
Agilent GPC/SEC	84	Accucore	140
Aqueous GPC/SEC Columns	85	Hypersil Gold	142
Aqueous Polymer Standards	87	Vydac	144
Organic GPC/SEC Columns	88	HPLC/MS Columns	144
Organic Polymer Standards	93	201TP™ and 202TP™	144
Concise Separations	94	Columns for Peptides & Polypeptides	145
Carbohydrate Analysis	94	Zirchrom Columns	146
Organic Acid Analysis	98	Zirconia Based HPLC Columns	146
Protein Analysis	101	ProTain® In-Line Protein Removal System	147
Amino Acid Analysis	102		
Ion Analysis	104		

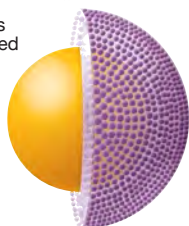


Featured Products

60 Agilent InfinityLab Poroshell 120



superficially porous particle for increased efficiency and decreased back pressure



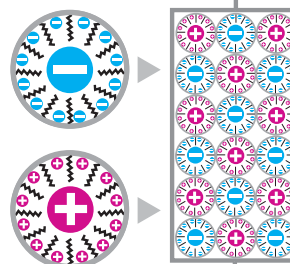
94 Concise Separations Columns



specializing in
Organic Acid Analysis
Carbohydrate Analysis
Fermentation Monitoring
Anion Analysis

121 Imtakt Scherzo C18 Family

ODS + Anion Ligand



ODS + Cation Ligand

The Scherzo C18 Family consists of not only ODS ligands, but also anion ligands and cation ligands. It also provides reversed-phase modes, both ion exchange modes, and normal phase mode.

130 Restek Raptor™ Biphenyl



Ideal for bioanalytical applications like drug and metabolite analyses

139 Millipore Sigma Chromolith® RP-18 endcapped



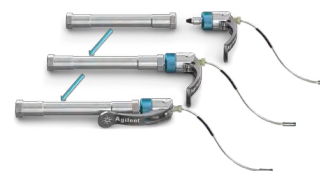
Chromolith® column consists of a single rod of high-purity polymeric silica gel with a bimodal pore structure of macro and mesopores

CHROM TECH RELATED PRODUCTS



Precolumn Filters, page 289

Economical protection for analytical columns in HPLC and UHPLC



Agilent A-Line Quick Connect Fitting, page 231

The proprietary Agilent design features a spring-loaded mechanism to ensure proper ferrule placement in the column port. A zero dead volume fingertight connection is achieved every time.

Notes from the Support Desk

How can we help you?

- Q** Looking for a U.S. Pharmacopeia column phase? ie: L1, L11, L43
 Looking for a column recommendation based on your specific application?
 Looking for a column alternative?
 Can't find the specific dimensions listed for your column?
 Can't find an Alltech or Vydac column?

Contact Chrom Tech Support Desk for a quote and technical recommendation—support@chromtech.com

A

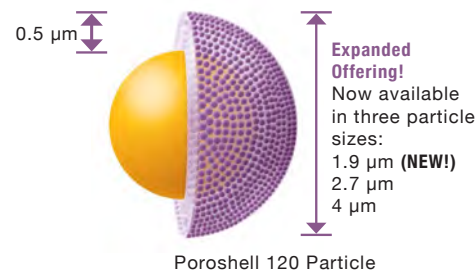
Agilent InfinityLab Poroshell 120 HPLC Columns

- ➔ 2 µm frit, for rugged performance with dirty samples
- ➔ High efficiency and high resolution
- ➔ Up to 50% less back pressure than sub 2 µm particle
- ➔ Compatible with 400/600 bar LC's, as well as UHPLCs

These high efficiency, high resolution columns can be used on any type of LC. The porous outer layer and solid core limit diffusion distance and improve separation speed while the narrow particle size distribution improves efficiency and resolution.

The Poroshell 120 family is expanding. Now, there are Three particle sizes (1.9, 2.7, and 4 µm) so you can choose the option to best fit your needs.

We recognize that you have your own quality control demands and that you test your method with multiple batches of material to ensure it's robust and reproducible. To support your requirements, we offer all-in-one kits that put method validation columns from three separate lots right at your fingertips. Simply add the letter "K" to the end of the part number.



(shown with column ID tag)

AGILENT INFINITY LAB POROSHELL 120 BONDED PHASE SPECIFICATIONS				
BONDED PHASE	PORE SIZE	TEMP LIMIT	pH RANGE	ENDCAPPED
EC-C18, EC-C8, Phenyl-Hexyl	120Å	60° C	2.0 – 8.0	Yes
SB-C18	120Å	90° C	1.0 – 8.0	No
SB-C8, SB-Aq	120Å	80° C	1.0 – 8.0	No
Bonus RP	120Å	60° C	2.0 – 9.0	Triple
HILIC	120Å	60° C	0.0 – 8.0	No
EC-CN	120Å	60° C	2.0 – 8.0	Double
PFP	120Å	60° C	2.0 – 8.0	Yes
HPH-C18, HPH-C8*	110Å	60° C	3.0 – 11.0	Yes

Specifications represent typical values only

*New Poroshell HPH-C18 and HPH-C8 technologies are made by chemically modifying Poroshell particles using proprietary technology designed to give high pH stability. Therefore, the pore sizes differ from the other phases in the Poroshell family.

TECH TIP

Optional Column ID Tag*

Column ID tags give you at a glance details about the last injection date, number of injections, and the maximum temperature used. To order, simply add a "T" to the end of any Agilent InfinityLab Poroshell 120 HPLC Column.

* Column ID Tags are only compatible with Agilent Infinity II thermostatted column compartment with column identification option.

AGILENT INFINITY LAB POROSHELL 120 2.7 µm									
SIZE (mm)	EC-C18	EC-C8	SB-C18	SB-C8	HPH-C18	HPH-C8	SB-Aq	BONUS RP	EC-CN
4.6 x 150	693975-902	693975-906	683975-902	683975-906	693975-702	693975-706	683975-914	693968-901	693975-905
4.6 x 100	695975-902	695975-906	685975-902	685975-906	695975-702	695975-706	685975-914	695968-901	695975-905
4.6 x 75	697975-902	697975-906	687975-902	—	—	—	—	—	—
4.6 x 50	699975-902	699975-906	689975-902	689975-906	699975-702	699975-706	689975-914	699968-901	699975-905
4.6 x 30	691975-902	691975-906	681975-902	—	—	—	—	—	—
4.6 x 5 Guard, 3/pk	820750-911	820750-913	820750-912	—	—	—	—	—	—
3.0 x 150	693975-302	693975-306	683975-302	683975-306	693975-502	693975-506	683975-314	693968-301	693975-305
3.0 x 100	695975-302	695975-306	685975-302	685975-306	695975-502	695975-506	685975-314	695968-301	695975-305
3.0 x 75	697975-302	697975-306	687975-302	—	—	—	—	—	—
3.0 x 50	699975-302	699975-306	689975-302	689975-306	699975-502	699975-506	689975-314	699968-301	699975-305
3.0 x 30	691975-302	691975-306	681975-302	—	—	—	—	—	—
3.0 x 5 Guard, 3/pk	823750-911	823750-913	823750-912	—	—	—	—	—	—
2.1 x 150	693775-902	693775-906	683775-902	683775-906	693775-702	693775-706	683775-914	693768-901	693775-905
2.1 x 100	695775-902	695775-906	685775-902	685775-906	695775-702	695775-706	685775-914	695768-901	695775-905
2.1 x 75	697775-902	697775-906	687775-902	—	—	—	—	—	—
2.1 x 50	699775-902	699775-906	689775-902	689775-906	699775-702	699775-706	689775-914	699768-901	699775-905
2.1 x 30	691775-902	691775-906	681775-902	—	—	—	—	—	—
2.1 x 5 Guard 3/pk	821725-911	821725-913	821725-912	—	—	—	—	—	—

AGILENT INFINITY LAB POROSHELL 120 2.7 μm			
SIZE (mm)	PFP	PHE-HEX	HILIC
4.6 x 150	693975-408	693975-912	693975-901
4.6 x 100	695975-408	695975-912	695975-901
4.6 x 50	699975-408	699975-912	699975-901
4.6 x 5 Guard, 3/pk	—	820750-914	—
3.0 x 150	693975-308	693975-312	693975-301
3.0 x 100	695975-308	695975-312	695975-301
3.0 x 50	699975-308	699975-312	699975-301
3.0 x 5 Guard, 3/pk	—	823750-914	—
2.1 x 150	693775-408	693775-912	693775-901
2.1 x 100	695775-408	695775-912	695775-901
2.1 x 50	699775-408	699775-912	699775-901
2.1 x 5 Guard, 3/pk	821725-915	821725-914	—

AGILENT INFINITY LAB POROSHELL 120 4 μm					
SIZE (mm)	EC-C18	EC-C8	PFP	PHE-HEX	HILIC
4.6 x 250	690970-902	690970-906	690970-408	690970-912	690970-901
4.6 x 150	693970-902	693970-906	693970-408	693970-912	693970-901
4.6 x 100	695970-902	695970-906	695970-408	695970-912	695970-901
4.6 x 50	699970-902	699970-906	699970-408	699970-912	699970-901
4.6 x 5 Guard, 3/pk	820750-916	—	—	—	—
3.0 x 250	690970-302	690970-306	690970-308	690970-312	690970-301
3.0 x 150	693970-302	693970-306	693970-308	693970-312	693970-301
3.0 x 100	695970-302	695970-306	695970-308	695970-312	695970-301
3.0 x 50	699970-302	699970-306	699970-308	699970-312	699970-301
3.0 x 5 Guard, 3/pk	823750-916	—	—	—	—
2.1 x 250	650750-902	650750-906	650750-408	650750-912	650750-901
2.1 x 150	693770-902	693770-906	693770-408	693770-912	693770-901
2.1 x 100	695770-902	695770-906	695770-408	695770-912	695770-901
2.1 x 50	699770-902	699770-906	699770-408	699770-912	699770-901
2.1 x 5 Guard, 3/pk	821725-916	—	—	—	—

UHPLC Guard Column 3/pk
Complete guard assembly—
No holder required



AGILENT INFINITY LAB POROSHELL 120 1.9 μm						
SIZE (mm)	EC-C18	EC-C8	HILIC	PFP	PHE-HEX	HPH-C18
3.0 x 150	693675-302	693675-306	693675-301	693675-308	693675-312	693675-502
3.0 x 100	695675-302	695675-306	695675-301	695675-308	695675-312	695675-502
3.0 x 50	699675-302	699675-306	699675-301	699675-308	699675-312	699675-502
3.0 Guard, 3/pk	823750-940	823750-941	823750-944	823750-942	823750-943	823750-945
2.1 x 150	693675-902	693675-906	693675-901	693675-408	693675-912	693675-702
2.1 x 100	695675-902	695675-906	695675-901	695675-408	695675-912	695675-702
2.1 x 75	699675-902	—	—	—	—	—
2.1 x 50	—	699675-906	699675-901	699675-408	699675-912	699675-702
2.1 Guard, 3/pk	821725-940	821725-941	821725-944	821725-942	821725-943	821725-945

TECH TIP

Column ID Tag* Standard on Poroshell 120 1.9 μm

Column ID tags give you at a glance details about the last injection date, number of injections, and the maximum temperature used.

* Column ID Tags are only compatible with Agilent Infinity II thermostatted column compartment with column identification option.

AGILENT INFINITY LAB POROSHELL 120 2.7 μm NEW!		
SIZE (mm)	HILIC-Z	HILIC-OH5
4.6 x 150	683975-924	683975-601
4.6 x 100	685975-924	685975-601
4.6 x 50	689975-924	689975-601
4.6 x 5 Guard, 3/pk	820750-933	—
3.0 x 150	683975-324	—
3.0 x 100	685975-324	—
3.0 x 50	689975-324	—
3.0 x 5 Guard, 3/pk	823750-948	—
2.1 x 150	683775-924	683775-601
2.1 x 150 PEEK lined	673775-924	—
2.1 x 100	685775-924	685775-601
2.1 x 100 PEEK lined	675775-924	—
2.1 x 50	689775-924	689775-601
2.1 x 50 PEEK lined	679775-924	—
2.1 x 5 Guard, 3/pk	821725-947	—

NEW Agilent Infinity Lab Poroshell 120 HILIC-Z Columns

- ➔ Novel zwitterionic stationary phase bonded to 2.7 μm Poroshell 120 particles
- ➔ PEEK-lined column option for excellent peak shape and recovery of particularly challenging charged compounds
- ➔ High pH and temperature stability: Up to pH 12 and 80 °C

NEW Agilent Infinity Lab Poroshell 120 HILIC-OH5 Columns

- ➔ Novel poly-hydroxy fructan phase bonded to 2.7 μm Poroshell 120 particles
- ➔ Offer alternative selectivity to HILIC and HILIC-Z phases

TECH TIP

Optional Column ID Tag*

Column ID tags give you at a glance details about the last injection date, number of injections, and the maximum temperature used. To order, simply add a "T" to the end of any Agilent InfinityLab Poroshell 120 HILIC-Z or HILIC-OH5 Column.

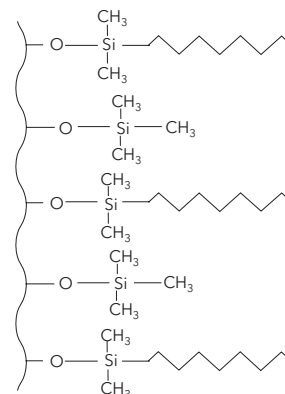
* Column ID Tags are only compatible with Agilent Infinity II thermostatted column compartment with column identification option.

Agilent ZORBAX Eclipse Plus

- ➔ The ideal column for method development—excellent for a wide range of compounds
- ➔ High level of performance—peak shape, efficiency, resolution, and lifetime—with all sample types: acids, bases and neutrals

Agilent ZORBAX Eclipse Plus columns provide the ultimate in performance for silica-based columns. Peak shape is excellent for the most challenging basic compounds, improving efficiency and resolution with these sample types. These results are achieved by improvements in the silica manufacturing and bonding technology, which is completely controlled by Agilent.

Because of their high level of performance, Eclipse Plus columns are the ideal first choice for method development of all samples. If you need to achieve fast method development and superior productivity, then choose a column with high-resolution 1.8 μm particles. For standard methods, conventional 5 μm and Rapid Resolution 3.5 μm columns are your best choice. With all particle sizes, easy method transfer is possible.



AGILENT ZORBAX ECLIPSE PLUS COLUMN SPECIFICATIONS

BONDED PHASE	PORE SIZE	SURFACE AREA	pH RANGE*	ENDCAPPED	TEMP LIMIT	CARBON LOAD
ZORBAX Eclipse Plus C18	95Å	160 m ² /g	2.0 – 9.0	Double	60 °C	9%
ZORBAX Eclipse Plus C8	95Å	160 m ² /g	2.0 – 9.0	Double	60 °C	7%
ZORBAX Eclipse PAH	95Å	160 m ² /g	2.0 – 8.0	No	60 °C	14%
ZORBAX Eclipse Plus Ph-Hex	95Å	160 m ² /g	2.0 – 8.0	Double	60 °C	9%

Specifications represent typical values only.

*Column lifetime will be reduced significantly at pH > 7 and temperatures > 40 °C. At pH 6-9, highest column stability for all silica based columns is obtained by operating at temperatures < 40 °C and using lower buffer concentrations in the range of 0.01 – 0.02 M, especially with phosphate and carbonate buffers.



ZORBAX Eclipse Plus Columns

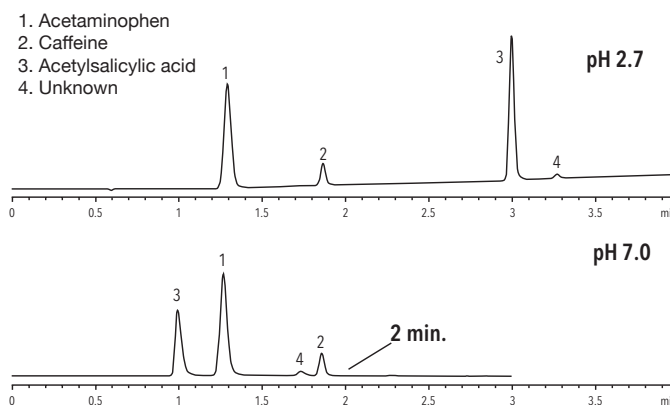
Rapid analysis of an analgesic tablet, selectivity differences at pH 2 and pH 7

Column A: Eclipse Plus C8
959946-906
4.6 x 50 mm, 5 μm

Gradient: 10 – 60% B/3 min
pH 2.7: A: 0.1% Formic acid B: 0.1% fa in ACN
pH 7.0: A: 20 mM Na phosphate B: ACN

Sample: generic Excedrin tablet

Both Eclipse Plus C18 and C8 can be used over a wide pH range to optimize selectivity or analysis time



Agilent ZORBAX Eclipse Plus HPLC COLUMNS

DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	Eclipse Plus C18 (USP L1)	Eclipse Plus C8 (USP L7)	Eclipse Plus Phenyl-Hexyl (USP L11)	Eclipse PAH (USP L1)
Analytical	4.6 x 250	5	959990-902	959990-906	959990-912	959990-918
Analytical	4.6 x 150	5	959993-902	959993-906	959993-912	959993-918
Analytical	4.6 x 100	5	959996-902	959996-906	959996-912	959996-918
Analytical	4.6 x 50	5	959946-902	959946-906	—	—
Rapid Resolution	4.6 x 150	3.5	959963-902	959963-906	959963-912	959963-918
Rapid Resolution	4.6 x 100	3.5	959961-902	959961-906	959961-912	959963-918
Rapid Resolution	4.6 x 75	3.5	959933-902	959933-906	959933-912	—
Rapid Resolution	4.6 x 50	3.5	959943-902	959943-906	959943-912	959943-918
Rapid Resolution	4.6 x 30	3.5	959936-902	959936-906	—	—
Guard Column Cartridges, 4/pk	4.6 x 12.5	5	820950-936	820950-937	820950-938	820950-939
High Performance ZORBAX Guard Fittings Kit			820999-901	820999-901	820999-901	820999-901
Rapid Resolution HT, 600 bar	4.6 x 100	1.8	959964-902	959964-906	959964-912	959964-918
Rapid Resolution HT, 600 bar	4.6 x 75	1.8	959951-902	—	—	—
Rapid Resolution HT, 600 bar	4.6 x 50	1.8	959941-902	959941-906	959941-912	959941-918
Rapid Resolution HT, 600 bar	4.6 x 30	1.8	959931-902	959931-906	959931-912	959931-918
UHPLC Guard, 600 bar, 3/pk	4.6 x 5	1.8	820750-901	—	—	—
Solvent Saver	3.0 x 250	5	—	—	—	959990-318
Solvent Saver	3.0 x 150	5	959993-302	959993-306	—	—
Solvent Saver Plus	3.0 x 150	3.5	959963-302	959963-306	959963-312	—
Solvent Saver Plus	3.0 x 100	3.5	959961-302	959961-306	959961-312	—
Guard Column Cartridges, 4/pk	4.6 x 12.5	5	820950-936	820950-937	820950-938	820950-939
High Performance ZORBAX Guard Fittings Kit			820999-901	820999-901	820999-901	820999-901
Solvent Saver RRHD, 1200 bar	3.0 x 150	1.8	959759-302	959759-306	—	—
Solvent Saver RRHD, 1200 bar	3.0 x 100	1.8	959758-302	959758-306	959758-312	959758-318
Solvent Saver RRHD, 1200 bar	3.0 x 50	1.8	959757-302	959757-306	959757-312	959757-318
Solvent Saver HT, 600 bar	3.0 x 100	1.8	959964-302	959964-306	959964-312	—
Solvent Saver HT, 600 bar	3.0 x 50	1.8	959941-302	959941-306	959941-312	—
UHPLC Guard Column, 1200 bar, 3/pk	3.0 x 5	1.8	823750-901	—	—	—
Narrow Bore	2.1 x 250	5	—	—	—	959790-918
Narrow Bore	2.1 x 150	5	959701-902	959701-906	959701-912	959701-918
Narrow Bore	2.1 x 50	5	959746-902	959746-906	—	—
Narrow Bore RR	2.1 x 150	3.5	959763-902	959763-906	959763-912	—
Narrow Bore RR	2.1 x 100	3.5	959793-902	959793-906	959793-912	959793-918
Narrow Bore RR	2.1 x 50	3.5	959743-902	959743-906	959743-912	—
Narrow Bore RR	2.1 x 30	3.5	959733-902	959733-906	959733-912	—
Guard Cartridges, 4/pk	2.1 x 12.5	5	821125-936	821125-937	821125-938	821125-939
High Performance ZORBAX Guard Fittings Kit			820999-901	820999-901	820999-901	820999-901
Narrow Bore RRHD, 1200 bar	2.1 x 150	1.8	959759-902	959759-906	959759-912	959763-918
Narrow Bore RRHD, 1200 bar	2.1 x 100	1.8	959758-902	959758-906	959758-912	959764-918
Narrow Bore RRHD, 1200 bar	2.1 x 50	1.8	959757-902	959757-906	959757-912	959741-918
Narrow Bore RRHT, 600 bar	2.1 x 100	1.8	959764-902	959764-906	959764-912	959764-918
Narrow Bore RRHT, 600 bar	2.1 x 50	1.8	959741-902	959741-906	959741-912	959741-918
Narrow Bore RRHT, 600 bar	2.1 x 30	1.8	959731-902	959731-906	959731-912	—
UHPLC Guard Column, 1200 bar, 3/pk	2.1 x 5	1.8	821725-901	—	—	—

UHPLC Guard Column
Complete guard assembly—
No holder required



High Performance ZORBAX
Guard Fittings Kit
820999-901



Authorized
Distributor



800.822.5242 | 952.431.6000 | www.chromtech.com

Agilent ZORBAX Eclipse XDB

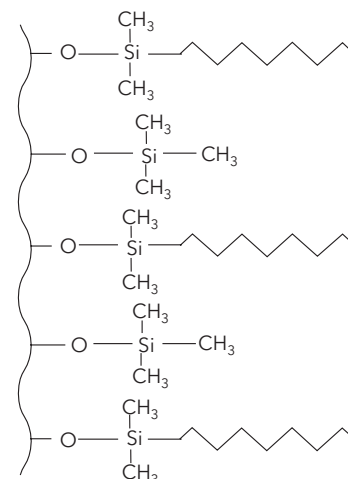
- ➔ Four selectivity choices for method development optimization
- ➔ Good peak shape for basic, acidic and neutral compounds
- ➔ High performance over a wide pH range—pH 2 – 9
- ➔ Particle sizes from 1.8 to 7 μm
- ➔ Long lifetime with eXtra Dense Bonding (XDB) and double endcapping

AGILENT ZORBAX ECLIPSE XDB COLUMN SPECIFICATIONS

BONDED PHASE	PORE SIZE	SURFACE AREA	pH RANGE*	ENDCAPPED	TEMP LIMIT	CARBON LOAD
ZORBAX Eclipse XDB C18	80Å	180 m ² /g	2.0 – 9.0	Double	60 °C	10%
ZORBAX Eclipse XDB C8	80Å	180 m ² /g	2.0 – 9.0	Double	60 °C	7.6%
ZORBAX Eclipse XDB-Phenyl	80Å	180 m ² /g	2.0 – 9.0	Double	60 °C	7.2%
ZORBAX Eclipse XDB-CN	80Å	180 m ² /g	2.0 – 8.0	Double	60 °C	4.3%

Specifications represent typical values only

*Eclipse XDB columns are designed for operation over a wide pH range. At pH 6 – 9, highest columns stability for all silica based columns is achieved by operating at temperatures < 40 °C and using low buffer concentrations in the range of 0.01 – 0.02 M.



eXtra Densely Bonded and Double Endcapped Eclipse XDB Bonded Phase

DESCRIPTION	SIZE (mm)	PARTICLE SIZE (μm)	Eclipse XDB-C18 (USP L1)	Eclipse XDB-C8 (USP L7)	Eclipse XDB-Phenyl (USP L11)	Eclipse XDB-CN (USP L10)
STANDARD COLUMNS (NO SPECIAL HARDWARE REQUIRED)						
SemiPrep	9.4 x 250	5	990967-202	990967-206	—	—
SemiPrep Guard Cartridge	9.4 x 15	5	820675-112*	820675-112*	820675-112*	820675-112*
SemiPrep Guard Hardware Kit			840140-901	840140-901	840140-901	840140-901
Analytical	4.6 x 250	5	990967-902	990967-906	990967-912	990967-905
Analytical	4.6 x 150	5	993967-902	993967-906	993967-912	993967-905
Analytical	4.6 x 50	5	946975-902	946975-906	—	—
Rapid Resolution	4.6 x 150	3.5	963967-902	963967-906	963967-912	963967-905
Rapid Resolution	4.6 x 100	3.5	961967-902	961967-906	—	961967-905
Rapid Resolution	4.6 x 75	3.5	966967-902	966967-906	966967-912	966967-905
Rapid Resolution	4.6 x 50	3.5	935967-902	935967-906	935967-912	—
Rapid Resolution	4.6 x 30	3.5	934967-902	934967-906	—	—
Rapid Resolution	4.6 x 20	3.5	932967-902	932967-906	—	—
Guard Cartridges, 4/pk	4.6 x 12.5	5	820950-925	820950-926	820950-927	820950-935
High Performance ZORBAX Guard Fittings Kit			820999-901	820999-901	820999-901	820999-901
Rapid Resolution HT, 600 bar	4.6 x 100	1.8	928975-902	928975-906	—	—
Rapid Resolution HT, 600 bar	4.6 x 50	1.8	927975-902	927975-906	—	—
Rapid Resolution HT, 600 bar	4.6 x 30	1.8	924975-902	924975-906	—	—
Rapid Resolution HT, 600 bar	4.6 x 20	1.8	926975-902	926975-906	—	—
UHPLC Guard Column, 1200 bar/3pk	4.6 x 5	1.8	820750-903	—	—	—
Solvent Saver	3.0 x 250	5	990967-302	990967-306	990967-312	990967-305
Solvent Saver	3.0 x 150	5	993967-302	993967-306	993967-312	993967-305
Solvent Saver Plus	3.0 x 150	3.5	963954-302	963954-306	963954-312	963954-305
Solvent Saver Plus	3.0 x 100	3.5	961967-302	961967-306	961967-312	—
Solvent Saver Plus	3.0 x 50	3.5	966954-302	—	—	—
Guard Cartridges, 4/pk	4.6 x 12.5	5	820950-925	820950-926	820950-927	820950-935
High Performance ZORBAX Guard Fittings Kit			820999-901	820999-901	820999-901	820999-901

*These columns are packed with Eclipse XDB-C18, 5 μm

Agilent ZORBAX Eclipse XDB HPLC COLUMNS

DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	Eclipse XDB-C18 (USP L1)	Eclipse XDB-C8 (USP L7)	Eclipse XDB-Phenyl (USP L11)	Eclipse XDB-CN (USP L10)
STANDARD COLUMNS (NO SPECIAL HARDWARE REQUIRED)						
Solvent Saver RRHD, 1200 bar	3.0 x 150	1.8	981759-302	—	—	—
Solvent Saver RRHD, 1200 bar	3.0 x 100	1.8	981758-302	—	—	—
Solvent Saver RRHD, 1200 bar	3.0 x 100	1.8	981757-302	—	—	—
Solvent Saver HT, 600 bar	3.0 x 100	1.8	928975-302	928975-306	—	—
Solvent Saver HT, 600 bar	3.0 x 50	1.8	927975-302	927975-306	—	—
Solvent Saver HT, 600 bar	3.0 x 30	1.8	924975-302	924975-306	—	—
Solvent Saver HT, 600 bar	3.0 x 20	1.8	926975-302	926975-306	—	—
UHPLC Guard Column, 1200 bar, 3/pk	3.0 x 5	1.8	823750-903	—	—	—
Narrow Bore	2.1 x 150	5	993700-902	993700-906	993700-912	993700-905
Narrow Bore	2.1 x 50	5	960967-902	960967-906	960967-912	960967-905
Narrow Bore RR	2.1 x 150	3.5	930990-902	930990-906	—	—
Narrow Bore RR	2.1 x 100	3.5	961753-902	961753-906	—	961753-905
Narrow Bore RR	2.1 x 75	3.5	966735-902	—	—	—
Narrow Bore RR	2.1 x 50	3.5	971700-902	971700-906	—	—
Narrow Bore RR	2.1 x 30	3.5	974700-902	974700-906	—	—
Narrow Bore RR	2.1 x 20	3.5	972700-902	972700-906	—	—
Guard Cartridges, 4/pk	2.1 x 12.5	5	821125-926	821125-926	821125-926	821125-935
High Performance ZORBAX Guard Fittings Kit			820999-901	820999-901	820999-901	820999-901
Narrow Bore RRHD, 1200 bar	2.1 x 150	1.8	981759-902	—	—	—
Narrow Bore RRHD, 1200 bar	2.1 x 100	1.8	981758-902	—	—	—
Narrow Bore RRHD, 1200 bar	2.1 x 50	1.8	981757-902	—	—	—
Narrow Bore RRHT, 600 bar	2.1 x 100	1.8	928700-902	928700-906	—	—
Narrow Bore RRHT, 600 bar	2.1 x 50	1.8	927700-902	927700-906	—	—
Narrow Bore RRHT, 600 bar	2.1 x 30	1.8	924700-902	924700-906	—	—
Narrow Bore RRHT, 600 bar	2.1 x 20	1.8	926700-902	926700-906	—	—
UHPLC Guard Column, 1200 bar, 3/pk	2.1 x 5	1.8	821725-903	—	—	—
MicroBore RR	1.0 x 150	3.5	963600-902	963600-906	—	—
MicroBore RR	1.0 x 50	3.5	965600-902	965600-906	—	—
MicroBore RR	1.0 x 30	3.5	961600-902	961600-906	—	—
MicroBore Guard Column, 3/pk	1.0 x 17	5	5185-5921	5185-5921	—	—
CAPILLARY GLASS-LINED COLUMNS						
Capillary	0.5 x 250	5	5064-8286	—	—	—
Capillary	0.5 x 150	5	5064-8287	—	—	—
Capillary RR	0.5 x 150	3.5	5064-8288	—	—	—
Capillary RR	0.5 x 35	3.5	5064-8298	—	—	—
Capillary	0.3 x 250	5	5064-8269	—	—	—
Capillary	0.3 x 150	5	5064-8291	—	—	—
Capillary RR	0.3 x 150	3.5	5064-8271	—	—	—
Capillary	0.5 x 35	5	5064-8296	—	—	—
Capillary	0.3 x 35	5	5064-8297	—	—	—

UHPLC Guard Column
Complete guard assembly—
No holder required



High Performance ZORBAX
Guard Fittings Kit
820999-901

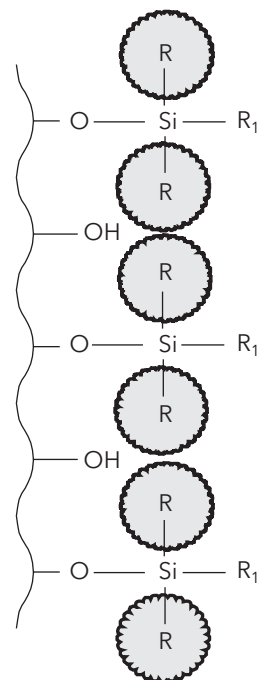


Cartridges
sold separately

Agilent ZORBAX 80Å StableBond

- ➔ Longest column lifetime and best reproducibility for low pH separations—down to pH 1
- ➔ Patented stable column chemistry allows use at high temperature and low pH without degradation
- ➔ Six different bonded phases provide broad selectivity—SB-C18, SB-C8, SB-CN, SB-Phenyl, SB-C3 and SB-Aq
- ➔ High purity (Type B) silica for good peak shape

Agilent ZORBAX StableBond columns use patented, unique, nonfunctional silanes with bulky disobutyl (SB-C18) or disopropyl (SB-C8, SB-C3, SB-Phenyl, SB-CN, and SB-Aq) side chain groups that sterically protect the key siloxane bond to the silica surface from hydrolytic attack at low pH. StableBond packing materials are not endcapped in order to provide exceptional stability and to maximize lifetime and reproducibility under acidic mobile phase conditions.



Sterically Protected StableBond Bonded Phase

AGILENT ZORBAX 80Å STABLEBOND COLUMN SPECIFICATIONS

BONDED PHASE	PORE SIZE	SURFACE AREA	pH RANGE*	ENDCAPPED	TEMP LIMITS*	CARBON LOAD
ZORBAX SB-C18	80Å	180 m ² /g	0.8 – 8.0	No	90 °C	10%
ZORBAX SB-C8	80Å	180 m ² /g	1.0 – 8.0	No	80 °C	5.5%
ZORBAX SB-C3	80Å	180 m ² /g	1.0 – 8.0	No	80 °C	4%
ZORBAX SB-Phenyl	80Å	180 m ² /g	1.0 – 8.0	No	80 °C	5.5%
ZORBAX SB-CN	80Å	180 m ² /g	1.0 – 8.0	No	80 °C	4%
ZORBAX SB-Aq	80Å	180 m ² /g	1.0 – 8.0	No	80 °C	proprietary

Specifications represent typical values only

*StableBond columns are designed for optimal use at low pH. At pH 6 – 8, highest column stability for all silica-based columns is obtained by operating at temperatures < 40 °C and using lower buffer concentrations in the range of 0.01 – 0.02 M. At mid-range pH, Eclipse Plus, Eclipse XDB and Bonus-RP are recommended.

StableBond SB-C18 shows excellent stability at low pH and high temperature (pH 0.8, 90 °C)

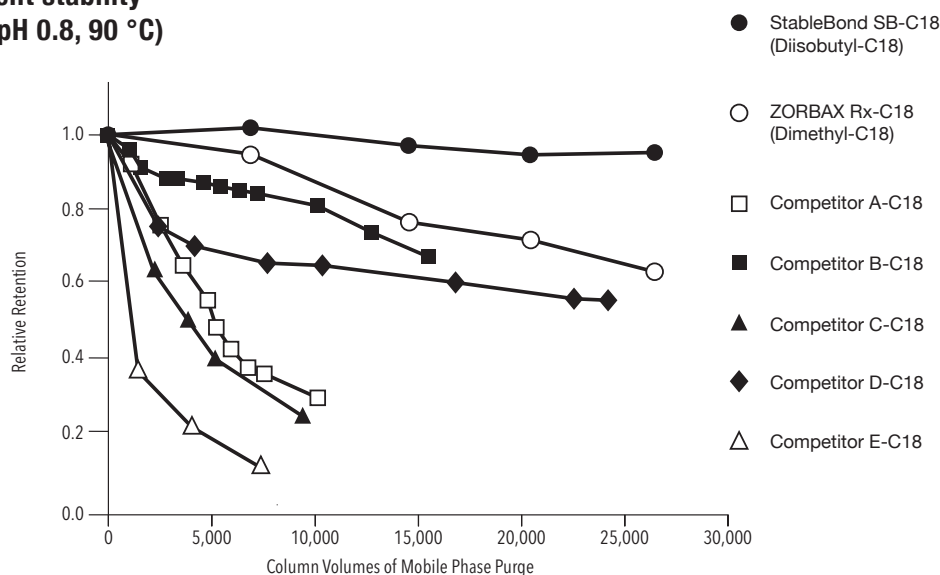
Column: ZORBAX SB-C18
883975-902
4.6 x 150 mm, 5 µm

Column: ZORBAX Rx-C18
883967-902
4.6 x 150 mm, 5 µm

Mobile Phase: 50% Methanol/50% Water with 1.0% TFA
Test Solute: Toluene

Temperature: 90 °C

As an indicator of column breakdown, retention time of toluene was measured after purging the column with mobile phase. Only the StableBond SB-C18 is unchanged after three working months of use under these very low pH (0.8) and high temperature (90 °C) conditions. ZORBAX Rx-C18 also provides a stable matrix, and can be used as an alternative selectivity to StableBond SB-C18



Agilent ZORBAX 80Å StableBond HPLC COLUMNS

DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	SB-C18 (USP L1)	SB-C8 (USP L7)	SB-CN (USP L10)	SB-C3 (USP L56)	SB-Phenyl (USP L11)	SB-Aq
STANDARD COLUMNS (NO SPECIAL HARDWARE REQUIRED)								
SemiPrep	9.4 x 250	5	880975-202	880967-201	880975-205	880975-209	880975-212	—
SemiPrep	9.4 x 150	5	883975-202	—	—	—	—	—
SemiPrep	9.4 x 100	5	884975-202	—	—	—	—	—
SemiPrep	9.4 x 50	5	846975-202	—	—	—	—	—
SemiPrep Guard Cartridges, 2/pk	9.4 x 15	7	820675-115	820675-115	820675-124	820675-124	820675-115	—
SemiPrep Guard Hardware Kit	9.4 x 15		840140-901	840140-901	840140-901	840140-901	840140-901	—
Analytical	4.6 x 250	5	880975-902	880975-906	880975-905	880975-909	880975-912	880975-914
Analytical	4.6 x 150	5	883975-902	883975-906	883975-905	883975-909	883975-912	883975-914
Analytical	4.6 x 50	5	846975-902	846975-906	—	—	—	846975-914
Rapid Resolution	4.6 x 250	3.5	884950-567	—	—	—	—	—
Rapid Resolution	4.6 x 150	3.5	863953-902	863953-906	863953-905	—	863953-912	863953-914
Rapid Resolution	4.6 x 100	3.5	861953-902	861953-906	861953-905	—	861953-912	861953-914
Rapid Resolution	4.6 x 75	3.5	866953-902	—	866953-905	—	866953-912	866953-914
Rapid Resolution	4.6 x 50	3.5	835975-902	835975-906	835975-905	—	835975-912	835975-914
Rapid Resolution	4.6 x 30	3.5	834975-902	834975-906	—	—	—	—
Rapid Resolution	4.6 x 20	3.5	832975-902	832975-906	—	—	—	—
Guard Cartridges, 4/pk	4.6 x 12.5	5	820950-920	820950-915	820950-916	820950-922	820950-917	820950-933
High performance ZORBAX guard fittings kit			820999-901	820999-901	820999-901	820999-901	820999-901	820999-901
Rapid Resolution HT, 600 bar	4.6 x 150	1.8	829975-902	829975-906	829975-905	—	829975-912	829975-914
Rapid Resolution HT, 600 bar	4.6 x 100	1.8	828975-902	828975-906	828975-905	—	828975-912	828975-914
Rapid Resolution HT, 600 bar	4.6 x 75	1.8	—	830975-906	—	—	—	—
Rapid Resolution HT, 600 bar	4.6 x 50	1.8	827975-902	827975-906	827975-905	—	827975-912	827975-914
Rapid Resolution HT, 600 bar	4.6 x 30	1.8	824975-902	824975-906	824975-905	—	824975-912	824975-914
Rapid Resolution HT, 600 bar	4.6 x 20	1.8	826975-902	826975-906	—	—	—	—
UHPLC Guard Columns, 600 bar, 3/pk	4.6 x 5	1.8	820750-902	820750-904	—	—	—	—
Solvent Saver	3.0 x 250	5	880975-302	880975-306	880975-305	880975-309	880975-312	880975-314
Solvent Saver	3.0 x 150	5	883975-302	883975-306	883975-305	883975-309	883975-312	883975-314
Solvent Saver Plus	3.0 x 150	3.5	863954-302	863954-306	863954-305	—	863954-312	863954-314
Solvent Saver Plus	3.0 x 100	3.5	861954-302	861954-306	861954-305	861954-309	861954-312	861954-314
Solvent Saver Plus	3.0 x 75	3.5	866953-302	—	—	—	—	—
Guard Cartridges, 4/pk	4.6 x 12.5	5	820950-920	820950-915	820950-916	820950-922	820950-917	820950-933
High performance ZORBAX guard fittings kit			820999-901	820999-901	820999-901	820999-901	820999-901	820999-901
Solvent Saver RRHD, 1200 bar	3.0 x 150	1.8	859700-302	859700-306	—	—	—	—
Solvent Saver RRHD, 1200 bar	3.0 x 100	1.8	858700-302	858700-306	858700-305	—	858700-312	858700-314
Solvent Saver RRHD, 1200 bar	3.0 x 50	1.8	857700-302	857700-306	857700-305	—	857700-312	857700-314
Solvent Saver HT, 600 bar	3.0 x 150	1.8	829975-302	829975-306	829975-305	—	829975-312	—
Solvent Saver HT, 600 bar	3.0 x 100	1.8	828975-302	828975-306	828975-305	828975-309	828975-312	828975-314
Solvent Saver HT, 600 bar	3.0 x 50	1.8	827975-302	827975-306	827975-305	—	—	—
Solvent Saver HT, 600 bar	3.0 x 30	1.8	824975-302	824975-306	824975-305	—	827975-312	827975-314
Solvent Saver HT, 600 bar	3.0 x 20	1.8	826975-302	826975-306	—	—	—	—
UHPLC Guard Columns, 1200 bar, 3/pk	3.0 x 5	1.8	823750-902	823750-904	—	—	—	—

Unless indicated, column pressure limit is 400 bar

(Continued on next page)

UHPLC Guard Column
Complete guard assembly—
No holder required

High Performance ZORBAX
Guard Fittings Kit
820999-901



Cartridges
sold separately

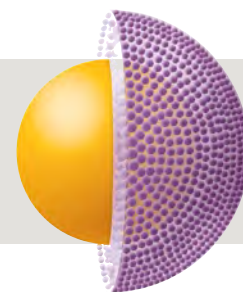
HPLC COLUMNS Agilent ZORBAX 80Å StableBond

DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	SB-C18 (USP L1)	SB-C8 (USP L7)	SB-CN (USP L10)	SB-C3 (USP L56)	SB-Phenyl (USP L11)	SB-Aq
STANDARD COLUMNS (NO SPECIAL HARDWARE REQUIRED)								
Narrow Bore	2.1 x 150	5	883700-922	—	883700-905	883700-909	883700-912	—
Narrow Bore	2.1 x 50	5	860975-902	860975-906	860975-905	860975-909	860975-912	860975-914
Narrow Bore RR	2.1 x 150	3.5	830990-902	830990-906	—	—	—	830990-914
Narrow Bore RR	2.1 x 100	3.5	861753-902	861753-906	861753-905	—	861753-912	861753-914
Narrow Bore RR	2.1 x 75	3.5	866735-902	—	—	—	—	—
Narrow Bore RR	2.1 x 50	3.5	871700-902	871700-906	—	—	—	871700-914
Narrow Bore RR	2.1 x 30	3.5	874700-902	874700-906	—	—	—	—
Narrow Bore RR	2.1 x 20	3.5	872700-902	872700-906	—	—	—	—
Guard Cartridge, 4/pk	2.1 x 12.5	5	821125-915	821125-915	821125-924	821125-924	821125-915	821125-933
High performance ZORBAX guard fittings kit			820999-901	820999-901	820999-901	820999-901	820999-901	820999-901
Narrow Bore RRHD, 1200 bar	2.1 x 150	1.8	859700-902	859700-906	859700-905	—	859700-912	859700-914
Narrow Bore RRHD, 1200 bar	2.1 x 100	1.8	858700-902	858700-906	858700-905	—	858700-912	858700-914
Narrow Bore RRHD, 1200 bar	2.1 x 50	1.8	857700-902	857700-906	857700-905	—	857700-912	857700-914
Narrow Bore RRHT, 600 bar	2.1 x 150	1.8	820700-902	820700-906	820700-905	—	820700-912	—
Narrow Bore RRHT, 600 bar	2.1 x 100	1.8	828700-902	828700-906	828700-905	—	828700-912	828700-914
Narrow Bore RRHT, 600 bar	2.1 x 50	1.8	827700-902	827700-906	827700-905	—	827700-912	827700-914
Narrow Bore RRHT, 600 bar	2.1 x 30	1.8	824700-902	824700-906	824700-905	—	824700-912	824700-914
Narrow Bore RRHT, 600 bar	2.1 x 20	1.8	826700-902	826700-906	—	—	—	—
UHPLC Guard Column, 1200 bar, 3/pk	2.1 x 5	1.8	821725-902	821725-904	—	—	—	—
MicroBore RR	1.0 x 150	3.5	863600-902	963600-906	863600-905	—	—	—
MicroBore RR	1.0 x 50	3.5	865600-902	865600-906	—	—	—	—
MicroBore RR	1.0 x 30	3.5	861600-902	861600-906	—	—	—	—
MicroBore Guard Column, 3/pk	1.0 x 17	5	5185-5920	5185-5920	—	—	—	—
PREPHT CARTRIDGE COLUMNS (REQUIRE ENDFITTINGS KIT 820400-901)								
PrepHT Cartridge	21.2 x 250	7	877250-102	877250-106	877250-105	—	877250-112	877250-114
PrepHT Cartridge	21.2 x 150	7	877150-102	877150-106	—	—	—	877150-114
PrepHT Cartridge	21.2 x 150	5	870150-902	870150-906	—	—	—	870150-914
PrepHT Cartridge	21.2 x 100	5	870100-902	870100-906	—	—	—	870100-914
PrepHT Cartridge	21.2 x 50	5	870050-902	870050-906	—	—	—	870050-914
PrepHT Cartridge, 2/pk	17.0 x 7.5	5	820212-920	820212-915	820212-915	—	820212-915	820212-933
Guard Cartridge Hardware			820444-901	820444-901	820444-901	820444-901	820444-901	820444-901
PrepHT Endfittings, 2/pk			820400-901	820400-901	820400-901	820400-901	820400-901	820400-901
AGILENT CARTRIDGE COLUMNS (REQUIRE HARDWARE KIT 5021-1845)								
Analytical	4.6 x 250	5	7995218-585	7995208-585	—	—	—	—
Analytical	4.6 x 150	5	7995218-595	7995208-595	—	—	—	—
Rapid Resolution	4.6 x 75	3.5	7995218-344	7995208-344	—	—	—	—
Guard Cartridges, 10/pk	4.0 x 4	5	7995118-504	7995118-504	—	—	—	—
Cartridge Holder			5021-1845	5021-1845	—	—	—	—

Unless indicated, column pressure limit is 400 bar

TECH TIP

ZORBAX StableBond SB-C18, SB-C8 and SB-Aq phases are also available in Poroshell 120 (see pg 60)



DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	SB-C18 (USP L1)	SB-C8 (USP L7)
STANDARD COLUMNS (NO SPECIAL HARDWARE REQUIRED)				
Rapid Resolution HT	4.6 x 50	1.8	822975-902	822975-906
Rapid Resolution HT, 3/pk	4.6 x 50	1.8	822975-932	—
Narrow Bore RRHT	2.1 x 50	1.8	822700-902	—
Narrow Bore RRHT, 3/pk	2.1 x 50	1.8	822700-932	—
CAPILLARY GLASS-LINED COLUMNS				
Capillary	0.5 x 250	5	5064-8258	—
Capillary	0.5 x 150	5	5064-8256	—
Capillary	0.5 x 35	5	5064-8254	—
Capillary RR	0.5 x 150	3.5	5064-8262	—
Capillary RR	0.5 x 35	3.5	5064-8260	—
Capillary	0.3 x 250	5	5064-8257	—
Capillary	0.3 x 150	5	5064-8255	—
Capillary	0.3 x 35	5	5064-8253	—
Capillary RR	0.3 x 150	3.5	5064-8261	—

Agilent ZORBAX 80Å StableBond

The high purity, low acidity silica provides excellent peak shape with acidic, basic and neutral compounds making StableBond columns an excellent choice for low pH method development. ZORBAX StableBond columns are compatible with all common mobile phases, including highly aqueous mobile phases.

Five different bonded phases provide selectivity options

Column A: ZORBAX SB-C18
883975-902
4.6 x 150 mm, 5 µm

Column B: ZORBAX SB-C8
883975-906
4.6 x 150 mm, 5 µm

Column C: ZORBAX SB-C3
883975-909
4.6 x 150 mm, 5 µm

Column D: ZORBAX SB-Phenyl
883975-912
4.6 x 150 mm, 5 µm

Column E: ZORBAX SB-CN
883975-905
4.6 x 150 mm, 5 µm

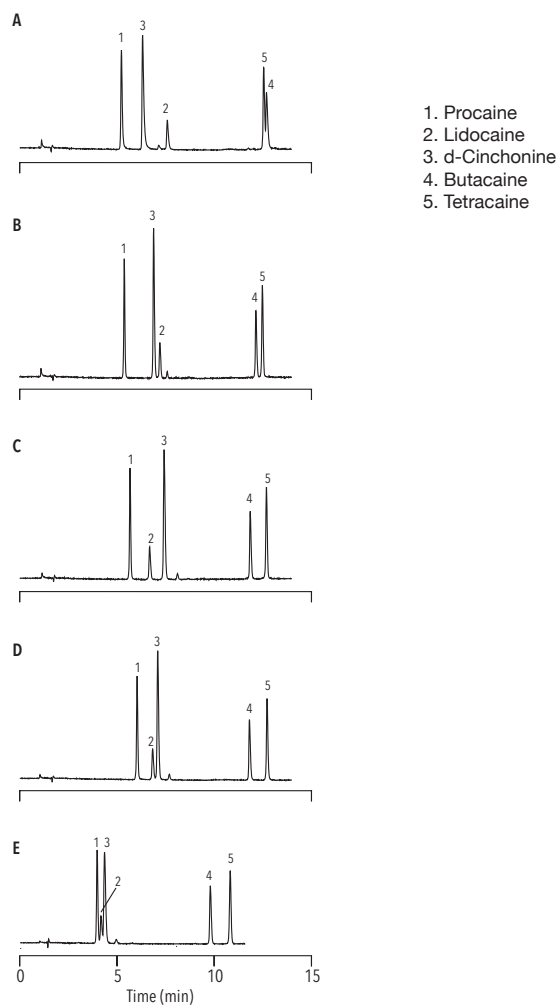
Mobile Phase: 0 – 100% B in 18.8 min
A: 50 mM NaH₂PO₄,
pH 2.5 in 95% H₂O/5% ACN
B: 50 mM NaH₂PO₄,
pH 2.5 in 47% H₂O/53% ACN

Flow Rate: 1.0 mL/min

Temperature: 26 °C

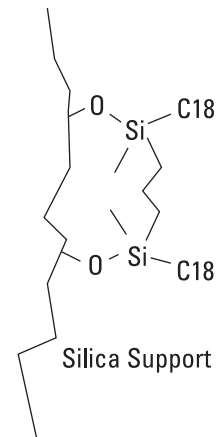
Detector: 254 nm

SB-C3 is just one of the five different StableBond selectivity choices. In this example, optimum resolution is obtained with SB-C3. All are based on the same high purity Rx-SIL. Selectivity changes are therefore dependent only on the bonded phases, making method development more reliable.



Agilent ZORBAX 80Å Extend-C18

- High efficiency and long life at pH up to 11.5
- Bidentate bonding and double endcapping provides high pH stability
- More efficiency and better peak shape than polymer-based columns
- Improve retention, resolution and peak shape of basic compounds
- High sensitivity for LC/MS separations of peptides



AGILENT ZORBAX 80Å EXTEND-C18 COLUMN SPECIFICATIONS

BONDED PHASE	PORE SIZE	SURFACE AREA	pH RANGE*	ENDCAPPED	TEMP LIMITS*	CARBON LOAD
ZORBAX Extend-C18	80Å	180 m ² /g	2.0 – 11.5	Double	60 °C	12.5%

Specifications represent typical values only

*Temperature limits are 60 °C up to pH 8, 40 °C from pH 8 – 11.5

**Above pH 6 highest column stability for all silica based columns is obtained by reducing the operating temperature to 40 °C or below and using lower buffer concentrations (0.01 – 0.02 M) or organic buffers.

Long life at high pH with Extend-C18

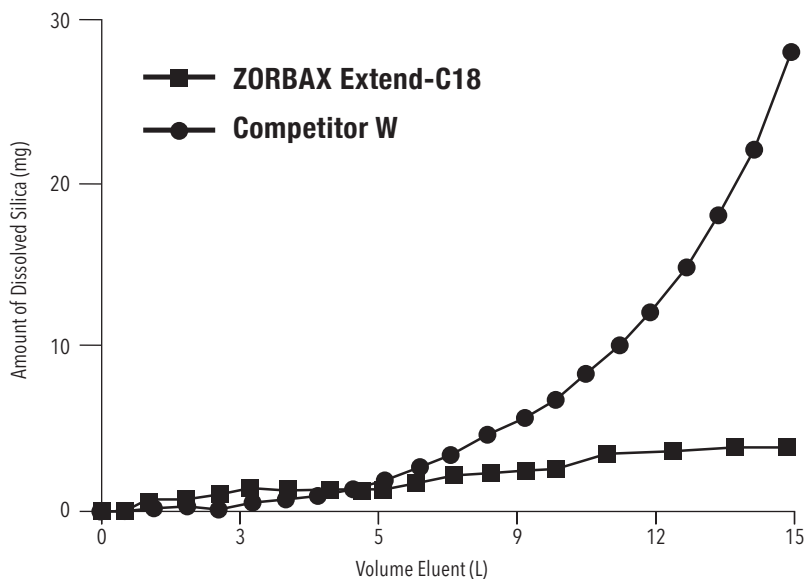
Column: ZORBAX Extend-C18
773450-902
4.6 x 150 mm, 5 µm

Mobile Phase: 20% Methanol
80% 0.1 M Carbonate buffer, pH 10.0

Flow Rate: 1.0 mL/min

Temperature: Ambient

At high pH, columns will fail due to silica dissolution. The example here shows extended lifetime of ZORBAX Extend-C18 at high pH in comparison to competitor W. This was measured by the amount of dissolved silica.



Agilent ZORBAX 80Å Extend-C18 (cont.)

DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	Extend-C18 (USP L1)
STANDARD COLUMNS (NO SPECIAL HARDWARE REQUIRED)			
Analytical	4.6 x 250	5	770450-902
Analytical	4.6 x 150	5	773450-902
Analytical	4.6 x 50	5	746450-902
Rapid Resolution	4.6 x 150	3.5	763953-902
Rapid Resolution	4.6 x 100	3.5	764953-902
Rapid Resolution	4.6 x 75	3.5	766953-902
Rapid Resolution	4.6 x 50	3.5	735953-902
Rapid Resolution HT, 600 bar	4.6 x 100	1.8	728975-902
Rapid Resolution HT, 600 bar	4.6 x 50	1.8	727975-902
Rapid Resolution HT, 600 bar	4.6 x 30	1.8	724975-902
Rapid Resolution HT, 600 bar	4.6 x 20	1.8	726975-902
Guard Cartridge, 4/pk	4.6 x 12.5	5	820950-930
Guard Hardware Kit			820999-901
Solvent Saver	3.0 x 250	5	770450-302
Solvent Saver	3.0 x 150	5	773450-302
Solvent Saver Plus	3.0 x 150	3.5	763954-302
Solvent Saver Plus	3.0 x 100	3.5	764953-302
Solvent Saver Plus	3.0 x 50	3.5	735954-302
Solvent Saver RRHD, 1200 bar	3.0 x 150	1.8	759700-302
Solvent Saver RRHD, 1200 bar	3.0 x 100	1.8	758700-302
Solvent Saver RRHD, 1200 bar	3.0 x 50	1.8	757700-302
Solvent Saver HT, 600 bar	3.0 x 100	1.8	728975-302
Solvent Saver HT, 600 bar	3.0 x 50	1.8	727975-302
Solvent Saver HT, 600 bar	3.0 x 30	1.8	724975-302
Solvent Saver HT, 600 bar	3.0 x 20	1.8	726975-302
Guard Cartridge, 4/pk	4.6 x 12.5	5	820950-930
Guard Hardware Kit			820999-901
Narrow Bore	2.1 x 150	5	773700-902
Narrow Bore	2.1 x 50	5	760450-902
Narrow Bore RR	2.1 x 100	3.5	761753-902
Narrow Bore RR	2.1 x 50	3.5	735700-902
Narrow Bore RRHD, 1200 bar	2.1 x 150	1.8	759700-902
Narrow Bore RRHD, 1200 bar	2.1 x 100	1.8	758700-902
Narrow Bore RRHD, 1200 bar	2.1 x 50	1.8	757700-902
Narrow Bore RRHT, 600 bar	2.1 x 100	1.8	728700-902
Narrow Bore RRHT, 600 bar	2.1 x 50	1.8	727700-902
Narrow Bore RRHT, 600 bar	2.1 x 30	1.8	724700-902
Narrow Bore RRHT, 600 bar	2.1 x 20	1.8	726700-902
Guard Cartridge, 4/pk	2.1 x 12.5	5	821125-930
Guard Hardware Kit			820999-901
MicroBore RR	1.0 x 150	3.5	763600-902
MicroBore RR	1.0 x 50	3.5	765600-902
MicroBore RR	1.0 x 30	3.5	761600-902
MicroBore Guard, 3/pk	1.0 x 17	5	5185-5923
Guard Hardware Kit			820999-901

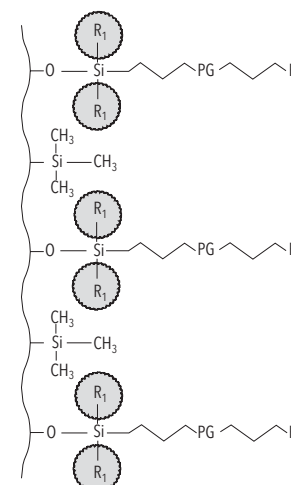
Unless indicated, column pressure limit is 400 bar

DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	Extend-C18 (USP L1)
PREPHT CARTRIDGE COLUMNS (REQUIRE ENDFITTINGS KIT 820400-901)			
PrepHT Cartridge	21.2 x 150	5	770150-902
PrepHT	21.2 x 100	5	770100-902
PrepHT	21.2 x 50	5	770050-902
PrepHT Endfittings, 2/pk			820400-901
PrepHT Guard Cartridge, 2/pk	17.0 x 7.5	5	820212-930
Guard Cartridge Hardware			820444-901

Agilent ZORBAX Bonus-RP

- ➔ Excellent peak shape for challenging basic compounds at low and mid pH
- ➔ Unique reversed-phase selectivity
- ➔ Novel bonding technology with embedded polar group and steric protection
- ➔ Usable in 100% aqueous mobile phases

The Agilent ZORBAX Bonus-RP column has a polar amide group embedded in a long alkyl chain. This novel bonding reduces interactions between basic compounds and the silica support, improving peak shape for the most difficult basic compounds. Peak shape and column lifetime are further improved by triple endcapping. In addition, diisopropyl side groups provide steric protection against acid hydrolysis for good lifetime at low pH. The Bonus-RP column provides an alternate selectivity to C18 and C8 alkyl bonded phases.



Unique, Polar Alkyl Bonus-RP Bonded Phase

AGILENT ZORBAX BONUS-RP COLUMN SPECIFICATIONS

BONDED PHASE	PORE SIZE	SURFACE AREA	pH RANGE	ENDCAPPED	TEMP LIMITS*	CARBON LOAD
ZORBAX Bonus-RP	80Å	180 m ² /g	2.0 – 9.0	Triple	60 °C	9.5%

Specifications represent typical values only

*Temperature limits are 60 °C up to pH 8, 40 °C from pH 8 – 9.

ZORBAX Bonus-RP is stable at low and mid pH

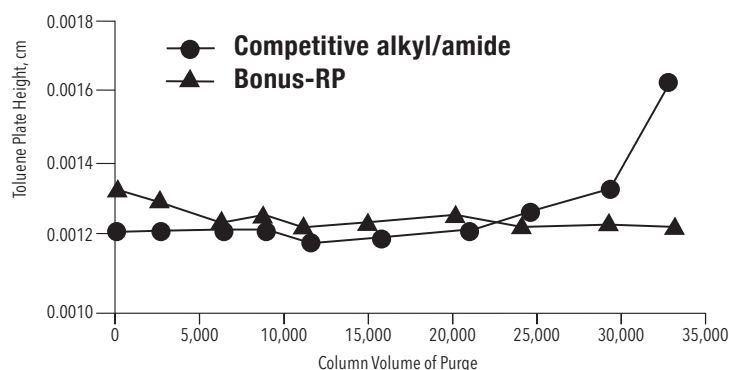
Column: **ZORBAX Bonus-RP**
883668-901
4.6 x 150 mm, 5 µm

Mobile Phase: 60% 25 mM
Phosphate Buffer,
pH 7.0:40% ACN

Flow Rate: 1.5 mL/min

Temperature: 23 °C

Triple endcapping of Bonus-RP enhances stability at pH 7. Each 10,000 column volume is equivalent to approximately one working month.



Dimethyl-C18/amide, Bonus-RP

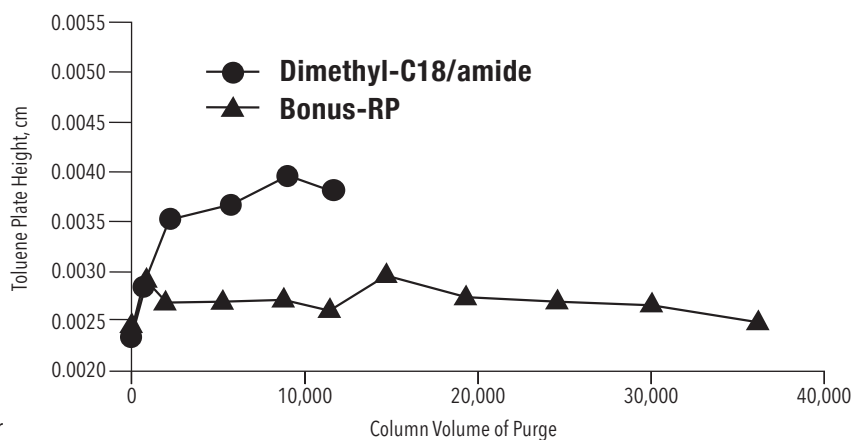
Column: **ZORBAX Bonus-RP**
883668-901
4.6 x 150 mm, 5 µm

Mobile Phase: Aging:
50% MeOH
50% 0.1% TFA
Test:
80% MeOH
20% H₂O

Flow Rate: 1.0 mL/min

Temperature: Aging:
60 °C
Test:
23 °C

Sterically protecting side groups provides low pH stability and longer column lifetime than similar polar alkyl bonded phases.



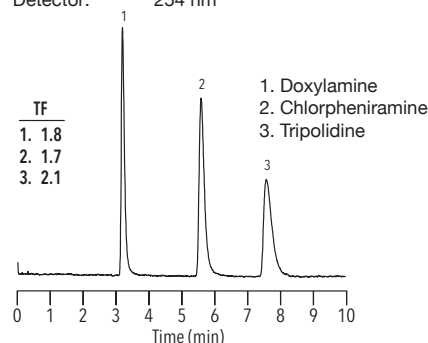
Agilent ZORBAX Bonus-RP (cont.)

DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	Bonus-RP (USP L60)
STANDARD COLUMNS (NO SPECIAL HARDWARE REQUIRED)			
Analytical	4.6 x 250	5	880668-901
Analytical	4.6 x 150	5	883668-901
Rapid Resolution	4.6 x 250	3.5	884950-577
Rapid Resolution	4.6 x 150	3.5	863668-901
Rapid Resolution	4.6 x 100	3.5	864668-901
Rapid Resolution	4.6 x 75	3.5	866668-901
Rapid Resolution	4.6 x 50	3.5	835668-901
Rapid Resolution HT, 600 bar	4.6 x 100	1.8	828668-901
Rapid Resolution HT, 600 bar	4.6 x 75	1.8	830668-901
Rapid Resolution HT, 600 bar	4.6 x 50	1.8	827668-901
Guard Cartridge, 4/pk	4.6 x 12.5	5	820950-928
Guard Hardware Kit			820999-901
Solvent Saver	3.0 x 250	5	880668-301
Solvent Saver	3.0 x 150	5	883668-301
Solvent Saver Plus	3.0 x 150	3.5	863668-301
Solvent Saver Plus	3.0 x 100	3.5	864668-301
Solvent Saver HT, 600 bar	3.0 x 100	1.8	828668-301
Solvent Saver HT, 600 bar	3.0 x 50	1.8	827668-301
Guard Cartridge, 4/pk	4.6 x 12.5	5	820950-928
Guard Hardware Kit			820999-901
Narrow Bore	2.1 x 150	5	883725-901
Narrow Bore	2.1 x 50	5	861971-901
Narrow Bore RR	2.1 x 120	3.5	863700-901
Narrow Bore RR	2.1 x 100	3.5	861768-901
Narrow Bore RR	2.1 x 50	3.5	861700-901
Rapid Resolution HD, 1200 bar	2.1 x 150	1.8	859768-901
Rapid Resolution HD, 1200 bar	2.1 x 100	1.8	858768-901
Rapid Resolution HD, 1200 bar	2.1 x 50	1.8	857768-901
Narrow Bore RRHT, 600 bar	2.1 x 100	1.8	828768-901
Narrow Bore RRHT, 600 bar	2.1 x 50	1.8	827768-901
Guard Cartridge, 4/pk	2.1 x 12.5	5	821125-928
Guard Hardware Kit			820999-901
MicroBore RR	1.0 x 150	3.5	863608-901
MicroBore RR	1.0 x 50	3.5	865608-901
MicroBore RR	1.0 x 30	3.5	861608-901
MicroBore Guard, 3/pk	1.0 x 17	5	5185-5922
Guard Hardware Kit			820999-901
PREPHT CARTRIDGE COLUMNS (REQUIRE ENDFITTINGS KIT 820400-901)			
PrepHT Cartridge	21.2 x 250	7	878250-101
PrepHT Cartridge	21.2 x 150	7	878150-101
PrepHT Cartridge	21.2 x 150	5	868150-901
PrepHT Cartridge	21.2 x 100	5	868100-901
PrepHT Cartridge	21.2 x 50	5	868050-901
PrepHT Endfittings, 2/pk			820400-901
PrepHT Guard Cartridge, 2/pk	17.0 x 7.5	5	820212-928
Guard Cartridge Hardware			820444-901

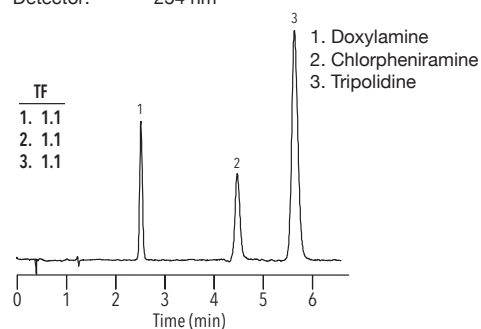
Unless indicated, column pressure limit is 400 bar

Improved peak shape of basic compounds using Bonus-RP

Column: Alkyl-C8
4.6 x 150 mm, 5 µm
Mobile Phase: 75% 25 mM NH₄OAc, pH 5.5
Flow Rate: 1.5 mL/min
Temperature: 40 °C
Detector: 254 nm



Column: ZORBAX Bonus-RP
883668-901
4.6 x 150 mm, 5 µm
Mobile Phase: 80% 25 mM NH₄OAc, pH 5.5
20% ACN
Flow Rate: 1.5 mL/min
Temperature: 40 °C
Detector: 254 nm



Bonus-RP eliminates peak tailing of these basic compounds in comparison to a typical alkyl C8 bonded phase. In the mid pH region, residual silanols can interact more strongly with basic compounds to cause peak tailing. The polar group in the Bonus-RP bonded phase eliminates peak tailing of these basic compounds by reducing interactions with residual silanols.

Agilent ZORBAX Eclipse PAH

DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	Eclipse PAH (USP L1)
Analytical	4.6 x 250	5	959990-918
Analytical	4.6 x 150	5	959993-918
Analytical	4.6 x 100	5	959996-918
Rapid Resolution	4.6 x 150	3.5	959963-918
Rapid Resolution	4.6 x 100	3.5	959961-918
Rapid Resolution	4.6 x 50	3.5	959943-918
Rapid Resolution HT, 600 bar	4.6 x 100	1.8	959964-918
Rapid Resolution HT, 600 bar	4.6 x 50	1.8	959941-918
Rapid Resolution HT, 600 bar	4.6 x 30	1.8	959931-918
Solvent Saver	3.0 x 250	5	959990-318
Guard Cartridges, 4/pk	4.6 x 12.5	5	820950-939
Guard Hardware Kit			820999-901
Narrow Bore	2.1 x 250	5	959790-918
Narrow Bore	2.1 x 150	5	959701-918
Narrow Bore RR	2.1 x 100	3.5	959793-918
Narrow Bore RRHT, 600 bar	2.1 x 100	1.8	959764-918
Narrow Bore RRHT, 600 bar	2.1 x 50	1.8	959741-918
Guard Cartridges, 4/pk	2.1 x 12.5	5	821125-939
Guard Hardware Kit			820999-901



ZORBAX Eclipse PAH Columns

- Extensive range of particle sizes (1.8, 3.5 and 5 µm) and sizes for fast and high resolution separations
- Each batch of material is specifically tested with PAHs for maximum reproducibility under expected operating conditions
- Excellent performance using the high quality, improved silica of Eclipse Plus columns
- Great for applications requiring "shape selectivity" or the separation of geometric isomers

ZORBAX ECLIPSE PAH COLUMN SPECIFICATIONS				
PORE SIZE	SURFACE AREA	pH RANGE	END-CAPPED	TEMP LIMIT
95Å	160 m ² /g	2.0–8.0	No	60 °C

Specifications represent typical values only.

Agilent ZORBAX HILIC Plus

DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	ZORBAX HILIC Plus
Analytical	4.6 x 100	3.5	959961-901
Analytical	4.6 x 50	3.5	959943-901
Narrow Bore	2.1 x 100	3.5	959793-901
Narrow Bore	2.1 x 50	3.5	959743-901
Rapid Resolution HD, 1200 bar	3.0 x 100	1.8	959758-301
Rapid Resolution HD, 1200 bar	3.0 x 50	1.8	959757-301
Rapid Resolution HD, 1200 bar	2.1 x 150	1.8	959759-901
Rapid Resolution HD, 1200 bar	2.1 x 100	1.8	959758-901
Rapid Resolution HD, 1200 bar	2.1 x 50	1.8	959757-901

ZORBAX HILIC PLUS COLUMN SPECIFICATIONS			
BONDED PHASE	PORE SIZE	SURFACE AREA	pH RANGE
ZORBAX HILIC Plus	95Å	160 m ² /g	0.0 – 8.0

Specifications represent typical values only.

Agilent ZORBAX NH2

DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	ZORBAX NH2
Analytical	4.6 x 250	5	880952-708
Analytical	4.6 x 150	5	883952-708
Analytical	2.1 x 50	5	860700-708
Guard Cartridges, 4/pk	4.6 x 12.5	5	820950-908
Guard Hardware Kit			820999-901

ZORBAX NH2 COLUMN SPECIFICATIONS				
BONDED PHASE	PORE SIZE	SURFACE AREA	pH RANGE	END CAPPED
ZORBAX NH2	70Å	300 m ² /g	2.0 – 7.0	Yes

Specifications represent typical values only.

Agilent ZORBAX Rx

AGILENT ZORBAX RX COLUMN SPECIFICATIONS						
BONDED PHASE	PORE SIZE	SURFACE AREA	pH RANGE*	ENDCAPPED	TEMP LIMIT	CARBON LOAD
ZORBAX Rx-C18	80Å	160 m ² /g	2.0 – 8.0	No	60 °C	12%
ZORBAX Rx-C8	80Å	160 m ² /g	1.0 – 8.0	No	80 °C	5.5%

- Recommended for alternate selectivity at low pH relative to Eclipse Plus C18, Eclipse XDB-C18 and StableBond SB-C18; for higher temperature applications, StableBond is recommended.
- Higher carbon load than SB-C18 columns (12% vs. 10%)
- High stability and good peak shape for low pH applications (up to pH 8)
- Manufactured using dimethyloctadecylsilane and non-encapped
- ZORBAX Rx-C8 is the same product as SB-C8

Specifications represent typical values only.

*At pH 6 – 9 highest column stability for all silica based columns is obtained by operating at temperatures < 40 °C and using lower buffer concentrations in the range of 0.01 – 0.02 M.

DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	Rx-C18 (USP L1)	Rx-C8* (USP L7)
Analytical	4.6 x 250	5	880967-902	880967-901
Analytical	4.6 x 150	5	883967-902	883967-901
Rapid Resolution	4.6 x 150	3.5	863967-902	—
Rapid Resolution	4.6 x 100	3.5	861967-902	—
Rapid Resolution	4.6 x 75	3.5	866967-902	—
Narrow Bore	2.1 x 150	5	883700-902	—
Narrow Bore RR	2.1 x 100	3.5	861767-902	—
Guard Cartridge, 4/pk	4.6 x 12.5	5	820950-914	820950-913
Guard Cartridge, 4/pk	2.1 x 12.5	5	821125-915	821125-915
High Performance ZORBAX Guard Fittings Kit			820999-901	820999-901

*Rx-C8 is the same product as SB-C8. For other sizes and configurations, see ZORBAX StableBond (pg 66)

Agilent Pursuit XRs

SIZE (mm)	PARTICLE SIZE (µm)	PURSUIT XRs C18	PURSUIT XRs C8	PURSUIT XRs DIPHENYL
4.6 x 150	5	A6000150X046	A6010150X046	A6020150X046
4.6 x 100	5	A6000100X046	A6010100X046	A6020100X046
4.6 x 50	5	A6000050X046	—	A6020050X046
4.6 x 150	3	A6001150X046	A6010150X046	A6021150X046
4.6 x 100	3	A6001100X046	A6011100X046	A6021100X046
4.6 x 50	3	A6001050X046	A6011050X046	A6021050X046
4.6 x 30	3	A6001030X046	—	A6021030X046
3.0 x 150	5	A6000150X030	A6010150X030	A6020150X030
3.0 x 100	5	A6000100X030	A6010100X030	A6020100X030
3.0 x 150	3	A6001150X030	A6011150X030	A6021150X030
3.0 x 100	3	A6001100X030	A6011100X030	A6021100X030
3.0 x 50	3	A6001050X030	A6011050X030	A6021050X030
2.0 x 150	5	A6000150X020	A6010150X020	A6020150X020
2.0 x 100	5	A6000100X020	A6010100X020	—
2.0 x 50	5	A6000050X020	A6010050X020	A6020050X020
2.0 x 250	3	A6001250X020	—	A6021250X020
2.0 x 150	3	A6001150X020	A6011150X020	A6021150X020
2.0 x 100	3	A6001100X020	A6011100X020	A6021100X020
2.0 x 50	3	A6001050X020	A6011050X020	A6021050X020
2.0 x 30	3	—	—	A6021030X020
2.0 x 20	3	A6001020X020	—	—
1.0 x 150	3	A6001150X010	—	—
1.0 x 100	3	A6001100X010	—	A6021100X010

AGILENT PURSUIT XRS COLUMN SPECIFICATIONS					
BONDED PHASE	USP METHOD	PORE SIZE	pH RANGE	END-CAPPED	CARBON LOAD
Pursuit XRs C18	L1	100Å	1.5-10	Yes	22%
Pursuit XRs C8	L7	100Å	1.5-10	Yes	15%
Pursuit XRs Diphenyl	L11	100Å	1.5-8.0	Yes	14.6%
Pursuit XRs Ultra C18	—	100Å	1.5-10	Yes	23.2%
Pursuit XRs Ultra C8	—	100Å	1.5-10	Yes	15%
Pursuit XRs Ultra Diphenyl	—	100Å	1.5-8.0	Yes	14.6%

SIZE (mm)	PARTICLE SIZE (µm)	PURSUIT XRs ULTRA C18	PURSUIT XRs ULTRA C8	PURSUIT XRs ULTRA DIPHENYL
3.0 x 150	2.8	A7501150X030	A7511150X030	—
3.0 x 100	2.8	A7501100X030	—	—
2.0 x 150	2.8	A7501150X020	—	—
2.0 x 100	2.8	A7501100X020	A7511100X020	A7521100X020
2.0 x 50	2.8	A7501050X020	A7511050X020	A7521050X020
2.0 x 30	2.8	A7501030X020	A7511030X020	A7521030X020

Agilent Polaris HPLC Columns

In areas like drug discovery where target compounds are increasingly polar, it is critical to have a reversed-phase column that performs well under aqueous conditions. Retention is critical, but cannot come with troublesome secondary interactions. Likewise, phase collapse and shifting retention times need to be avoided. The answer is our Polaris line of polar-modified columns.

From the collapse-resistant pore structure of our base silica, to the "wettability" engineered into the bonded phases, Polaris columns have been designed for high aqueous conditions. The combination of high phase density bonding, ultra pure silica, and silanol shielding leads to excellent peak shape among polar-modified columns. As a family, Polaris offers a variety of polar modifications in both C18 and C8 chemistries.



Polaris HPLC Columns

AGILENT POLARIS COLUMN SPECIFICATIONS

BONDED PHASE	PORE SIZE	SURFACE AREA	CARBON LOAD	ENDCAPPED	PORE VOLUME	LIGAND COVERAGE
POLARIS C18-A	180Å	200 m ² /g	13.8%	Yes	1.1 cm ³ /g	3.9 μmol/m ²
Polaris C8-A	180Å	200 m ² /g	7.4%	Yes	1.1 cm ³ /g	4.8 μmol/m ²
Polaris C18-Ether	180Å	200 m ² /g	12.1%	Yes	1.1 cm ³ /g	3.3 μmol/m ²
Polaris C8-Ether	180Å	200 m ² /g	7.1%	Yes	1.1 cm ³ /g	4.5 μmol/m ²
Polaris Amide C18	180Å	200 m ² /g	15%	Yes	1.1 cm ³ /g	4.4 μmol/m ²
Polaris NH ₂	180Å	200 m ² /g	5.5%	Amide	1.1 cm ³ /g	3.8 μmol/m ²
Polaris Si-A	180Å	200 m ² /g	N/A	N/A	1.1 cm ³ /g	N/A

Specifications represent typical values only.

Polaris C18-A

Polaris C18-A is the best starting place for separations where the benefits of polar-modified columns are desired. The polar modifications of C18-A help to avoid poor peak shape and retention issues in low organic conditions.

Polaris C8-A

Polaris C8-A offers an alternative selectivity to standard C8 phases and has a lower hydrophobicity than Polaris C18-A, making it ideal for polar samples, and faster overall analysis times.

Polaris C18-Ether

Polaris C18-Ether offers an alternative selectivity to Polaris C18-A and standard C18 phases, and typically delivers increased retention of polar compounds away from the void volume.

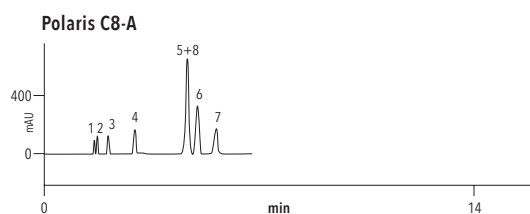
Polaris C8-Ether

Polaris C8-Ether offers an alternative selectivity to Polaris C8-A with particular utility for hydrogen bonding compounds.

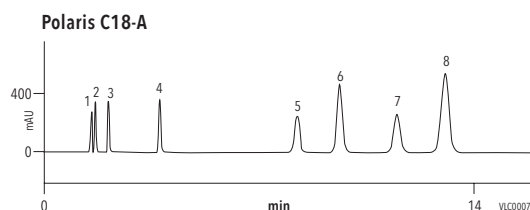
Polaris Amide C18

Polaris Amide C18 has an embedded amide and provides subtle alternative selectivity because they do not have steric protection.

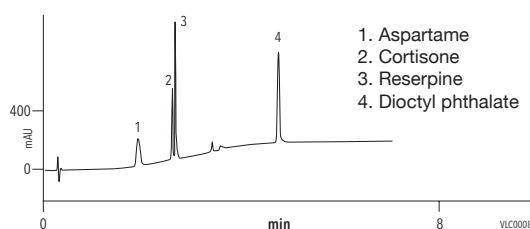
Selectivity test mix for Polaris columns



Mobile Phase: MeCN water 70:30
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detector: UV, 254 nm



LC/MS performance test mix for Polaris C8-A



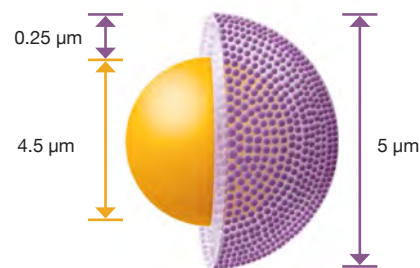
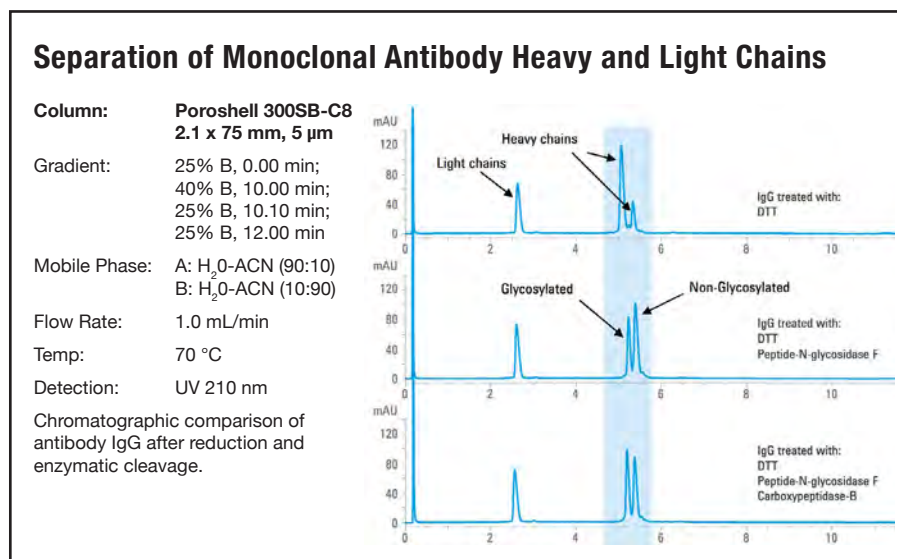
1. Aspartame
2. Cortisone
3. Reserpine
4. Dioctyl phthalate

Column: Polaris C8-A
A2011030X030
3.0 x 30 mm, 3 μm
Mobile Phase: A: Water+0.05% HCOOH
B: MeCN+0.05% HCOOH
Flow Rate: 0.6 mL/min
Gradient: 5-90% B in 3 min and hold for 4 min
Temperature: Ambient
Detector: UV, 220 nm

DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	POLARIS C18-A	POLARIS C8-A	POLARIS C18-ETHER	POLARIS C8-ETHER	POLARIS AMIDE C18	POLARIS NH2*	POLARIS Si-A*
Column	50.0 x 250	10	A2002250X500	—	—	—	—	—	—
Column	21.2 x 250	10	A2002250X212	—	—	—	—	—	A2004250X212
Column	10.0 x 250	10	—	—	—	—	A2008250X100	—	—
Column	4.6 x 250	10	A2002250X046	—	—	—	—	—	A2003250X046
Metaguard	4.6	10	A2002MG	—	—	—	—	—	A2004MG
Column	21.2 x 250	5	A2000250X212	A2010250X212	A2020250X212	—	—	A2013250X212	A2003250X212
Column	21.2 x 150	5	A2000150X212	—	—	—	—	—	A2003150X046
Column	21.2 x 100	5	A2000100X212	—	—	—	—	—	—
Column	21.2 x 50	5	—	—	—	—	—	—	A2003050X212
Column	10.0 x 250	5	A2000250X100	—	A2020250X100	A2030250X100	A2006250X100	A2013250X100	—
Column	4.6 x 250	5	A2000250X046	A2010250X046	A2020250X046	—	A2006250X046	A2013250X046	—
Column	4.6 x 200	5	A2000200X046	—	—	—	—	—	—
Column	4.6 x 150	5	A2000150X046	A2010150X046	A2020150X046	A2030150X046	A2006150X046	A2013150X046	A2003150X046
Column	4.6 x 100	5	A2000100X046	A2010100X046	—	—	—	A2013100X046	A2003100X046
Column	4.6 x 50	5	A2000050X046	—	A2020050X046	—	A2006050X046	A2013050X046	A2003050X046
Column	4.6 x 30	5	A2000030X046	—	—	—	—	—	—
Column	4.0 x 250	5	A2000250X040	A2010250X040	A2020250X040	A2030250X040	—	—	A2003250X040
Column	4.0 x 150	5	A2000150X040	A2010150X040	A2020150X040	A2030150X040	—	A2013150X040	A2003150X040
Column	4.0 x 125	5	A2000125X040	A2010125X040	A2020125X040	A2030125X040	—	A2013125X040	A2003125X040
Column	3.0 x 250	5	A2000250X030	A2010250X030	A2020250X030	A2030250X030	A2006250X030	A2013250X030	A2005250X046
Column	3.0 x 150	5	A2000150X030	A2010150X030	A2020150X030	A2030150X030	A2006150X030	A2013150X030	A2003150X030
Column	3.0 x 100	5	A2000100X030	A2010100X030	A2020100X030	A2030100X030	A2006100X030	A2013100X030	A2003100X030
Column	3.0 x 50	5	A2000050X030	—	—	—	—	—	A2003050X030
Metaguard	4.6	5	A2000MG	A2010MG	A2020MG	A2030MG	A2006MG	A2013MG	A2003MG
Column	2.0 x 250	5	A2000250X020	—	A2020250X020	A2030250X020	A2006250X020	A2013250X020	A2003250X020
Column	2.0 x 150	5	A2000150X020	A2010150X020	A2020150X020	A2030150X020	A2006150X020	A2013150X020	A2003150X020
Column	2.0 x 100	5	A2000100X020	—	—	—	A2006100X020	A2013100X020	A2003100X020
Column	2.0 x 50	5	A2000050X020	A2010050X020	A2020050X020	A2030050X020	A2006050X020	A2013050X020	—
Column	2.0 x 30	5	A2000030X020	—	—	—	A2006030X020	A2013030X020	A2003030X020
Column	2.0 x 20	5	A2000020X020	—	—	—	—	A2013020X020	A2003020X020
Metaguard	2.0	5	A2000MG2	A2010MG2	A2020MG2	—	A2006MG2	A2013MG2	A2003MG2
Column	10.0 x 50	3	—	—	A2021050X100	—	—	—	—
Column	4.6 x 250	3	A2001250X046	—	A2021250X046	A2031250X046	A2007250X046	A2014250X046	A2005250X046
Column	4.6 x 150	3	A2001150X046	A2011150X046	—	—	A2007150X046	A2014150X046	A2005150X046
Column	4.6 x 100	3	A2001100X046	A2011100X046	—	—	A2007100X046	A2014100X046	A2005100X046
Column	4.6 x 75	3	A2001075X046	A2011075X046	—	—	—	—	—
Column	4.6 x 50	3	A2001050X046	—	A2021050X046	A2031050X046	A2007050X046	A2014050X046	A2005050X046
Column	4.6 x 30	3	A2001030X046	—	—	—	—	—	—
Column	3.0 x 250	3	A2001250X030	—	—	—	A2007250X030	A2014250X030	A2003250X030
Column	3.0 x 150	3	A2001150X030	—	A2021150X030	—	A2007150X030	A2014150X030	A2005150X030
Column	3.0 x 100	3	A2001100X030	—	—	—	A2007100X030	A2014100X030	A2005100X030
Column	3.0 x 50	3	A2001050X030	—	A2021050X030	A2031050X030	A2007050X030	A2014050X030	A2005050X030
Column	3.0 x 30	3	A2001030X030	—	—	—	—	—	—
Metaguard	4.6	3	A2001MG	A2011MG	A2021MG	—	A2007MG	A2014MG	A2005MG
Column	2.0 x 250	3	A2001250X020	A2011250X020	A2021250X020	A2031250X020	A2007250X020	A2014250X020	A2005250X020
Column	2.0 x 150	3	A2001150X020	A2011150X020	A2021150X020	A2031150X020	A2007150X020	A2014150X020	A2005150X020
Column	2.0 x 100	3	A2001100X020	—	A2021100X020	A2031100X020	A2007100X020	A2014100X020	A2005100X020
Column	2.0 x 75	3	—	—	A2021075X020	—	—	—	—
Column	2.0 x 50	3	A2001050X020	A2011050X020	A2021050X020	A2031050X020	A2007050X020	A2014050X020	A2005050X020
Column	2.0 x 30	3	A2001030X020	—	A2021050X020	—	—	A2014030X020	A2005030X020
Column	2.0 x 20	3	A2001020X020	—	—	—	—	A2014020X020	A2005020X020
Metaguard	2.0	3	A2011MG2	A2011MG2	A2021MG2	A2031MG2	A2007MG2	A2014MG2	A2005MG2

*Normal phase columns

Agilent Poroshell 300 HPLC Columns



Poroshell 300 Particle

- ➔ 5 µm particle
- ➔ 0.25 µm, 300Å porous shell on solid particle
- ➔ StableBond chemistry
- ➔ Use Poroshell 300 columns for analyzing intact proteins and large peptide fragments

SIZE (mm)	300SB-C18	300SB-C8	300SB-C3	300Extend-C18
2.1 x 75	660750-902	660750-906	660750-909	670750-902
1.0 x 75	661750-902	661750-906	661750-909	671750-902
0.5 x 75	—	5065-4468	—	—
2.1 x 12.5 Guard Cartridge*, 4/pk	821075-920*	821075-918*	821075-924*	—
Guard hardware kit	820999-901	820999-901	820999-901	—
1 x 17 Guard Assembly, 3/pk	5185-5968	5185-5968	5185-5968	5185-5968

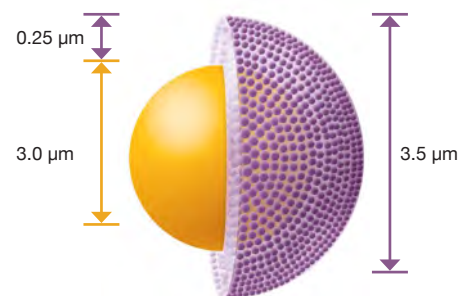
*Requires hardware kit

AGILENT POROSHELL 300 SPECIFICATIONS				
BONDED PHASE	PORE SIZE	TEMP LIMIT	pH RANGE	END-CAPPED
300SB-C18	300Å	90° C	1.0 – 8.0	No
C8	300Å	90° C	1.0 – 8.0	No
C3	300Å	90° C	1.0 – 8.0	No
300Extend-C18	300Å	60 °C 40 °C	2.0 – 8.0 8.0 – 11.0	Yes

Agilent AdvanceBio RP-mAb Columns

- ➔ **Improved accuracy**—3.5 µm superficially porous particle with wide 450Å pore increases mAb resolution
- ➔ **Selectivity**—range of phases available (C4, SB-C8, Diphenyl)
- ➔ **Lifetime/Lower Costs**—2 µm inlet frit and robust packed bed extends column lifetime by helping prevent inlet blockage
- ➔ Larger 450Å pore provides less carry-over

The Agilent AdvanceBio RP-mAb column delivers higher resolution and faster run times to provide accurate, reproducible results when analyzing intact mAb, mAb fragments (light and heavy chain or Fc and Fab), or other large biomolecules.



AdvanceBio RP-mAb Particle

SIZE (mm)	C4	SB-C8	DIPHENYL
4.6 x 150	793975-904	783975-906	793975-944
4.6 x 100	795975-904	785975-906	795975-944
4.6 x 50	799975-904	789975-906	799975-944
2.1 x 150	793775-904	783775-906	793775-944
2.1 x 100	795775-904	785775-906	795775-944
2.1 x 75	797775-904	787775-906	797775-944
2.1 x 50	799775-904	789775-906	799775-944

ADVANCEBIO RP-mAb SPECIFICATIONS				
BONDED PHASE	PORE SIZE	TEMP LIMIT	pH RANGE	END-CAPPED
C4	450Å	90° C	1.0 – 8.0	Yes
SB-C8	450Å	90° C	1.0 – 8.0	No
Diphenyl	450Å	90° C	1.0 – 8.0	Yes

Agilent AdvanceBio Glycan Mapping Columns

- ➔ **Speed**—Obtain glycan maps in less than 10 minutes
- ➔ **High-resolution**—Characterize both labeled and unlabeled glycans; identify any glycosylation changes that occur due to process variables
- ➔ **Flexibility**—Choose from:
 - 2.7 μm superficially porous particles for high resolution with less backpressure—compatible with all LC instruments
 - 1.8 μm fully porous particles for UHPLC analysis
- ➔ **Reproducibility**—QA tested with a 2-AB labeled IgG N-linked glycan sample to ensure consistent quality and performance

ADVANCEBIO GLYCAN MAPPING COLUMNS 1.8 μm , FULLY POROUS

SIZE (mm)	MAX PRESSURE	PART NO
2.1 x 150	1200 bar	859700-913
2.1 x 100	1200 bar	858700-913
2.1 x 5 Guard, ea	1200 bar	821725-905

ADVANCEBIO GLYCAN MAPPING COLUMNS 2.7 μm , SUPERFICIALLY POROUS

2.1 x 250	600 bar	651750-913
2.1 x 150	600 bar	683775-913
2.1 x 100	600 bar	685775-913
2.1 x 5 Guard, ea	600 bar	821725-906
4.6 x 250	600 bar	680975-913
4.6 x 150	600 bar	683975-913
4.6 x 100	600 bar	685975-913



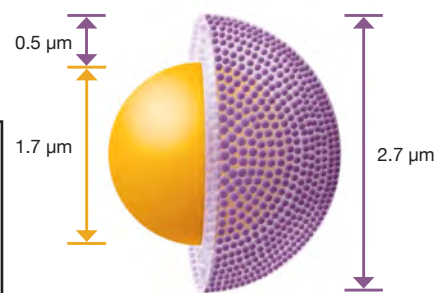
GLYCAN STANDARDS

DESCRIPTION	PART NO
Dextran ladder standard, 10 μg , 0.5 mL vial	5190-6997
2-AB labeled dextran ladder standard, 200 pmol	5190-6998
IgG N-linked glycan library, 20 μg , 0.5 mL	5190-6995
2-AB labeled IgG N-linked glycan library, 200 pmol	5190-6996



Agilent InfinityLab Poroshell 120 AdvanceBio Peptide Mapping Columns

Each batch of AdvanceBio Peptide Mapping media is tested with a rigorous peptide mix to ensure suitability and reproducibility, and to enable the identification of key peptides in complex peptide maps.



Quality Assurance Testing with Peptide Mix

Column: AdvanceBio Peptide Mapping 653750-902
2.1 x 150 mm, 2.7 μm

Flow Rate: 0.5 mL/min

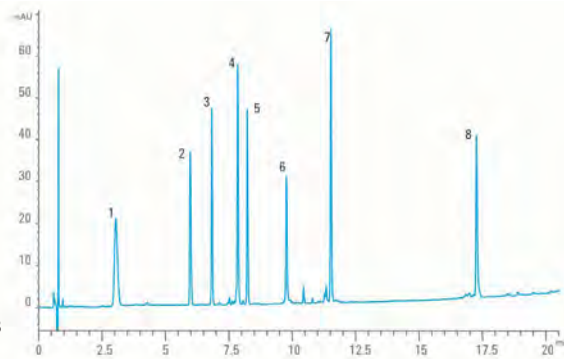
Injection: 5 μL

Temp: 55 $^{\circ}\text{C}$

Detection: 220 nm

Gradient: A, water (0.1% TFA)
B, ACN (0.08% TFA), 0 – 25 min, 15 – 65%
B, 25 – 26 min, 65 – 95% B

Sample: Agilent Peptide Mapping Standards Mix (0.5 – 1.0 $\mu\text{g}/\mu\text{L}$ per peptide)
p/n 5190-0583



PK	COMPONENT
1	Bradykinin fragment 1-7
2	Bradykinin
3	Angiotensin II
4	Neurotensin
5	Angiotensin I
6	ACTH fragment 18-39
7	Renin
8	Melittin



Test mix used for every batch of AdvanceBio Peptide Mapping media contains 8 hydrophilic, hydrophobic, and basic peptides, ranging in molecular weight from 757 Da to 2845 Da. Every column is also tested with a small-molecule probe to ensure efficiency.

Poroshell 120 Particle



AdvanceBio Peptide Mapping Columns

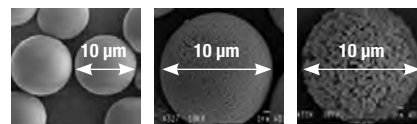
AGILENT INFINITYLAB POROSHELL 120 ADVANCEBIO PEPTIDE MAPPING COLUMNS

SIZE (mm)	PART NO
4.6 x 150	653950-902
4.6 x 5 Guard, 3/pk	850750-911
3.0 x 150	653950-302
3.0 x 5 Guard, 3/pk	853750-911
2.1 x 250	651750-902
2.1 x 150	653750-902
2.1 x 100	655750-902
2.1 x 5 Guard, 3/pk	851725-911
10 Peptide Standard	5190-0583

Agilent PLRP-S

- ➔ Contain durable and resilient polymer particles that deliver reproducible results over longer lifetimes
- ➔ Thermally and chemically stable
- ➔ Comply with USP L21 designation
- ➔ Used in bioscience, chemical, clinical research, energy, environmental, food and agriculture, material science and pharmaceutical industries
- ➔ Pore sizes (100Å – 4000Å) for separations of small molecules to large complexes and polynucleotides

The PLRP-S for biomolecules family of products consists of a range of pore sizes and particle sizes, all with identical chemistry and fundamental adsorptive characteristics. The particles are inherently hydrophobic so there is no bonded phase, alkyl ligand required for reversed-phase separations. This gives a highly reproducible material that is free from silanols and heavy metal ions. Within the extensive product range are columns suitable for analytical separations, and preparative purifications.



Scanning electron micrographs (SEM) of PLRP-S 10 µm particles
The difference in pore size is clearly seen.
A is the small pore 100Å
B the larger pore 300Å
C the gigaporous 4000Å

SIZE (mm)	PARTICLE SIZE (µm)	PLRP-S 100Å USP L21	PLRP-S 300Å USP L21	PLRP-S 1000Å USP L21	PLRP-S 4000Å USP L21
4.6 x 250	8	PL1512-5800	PL1512-5801	PL1512-5802	—
4.6 x 150	8	PL1512-3800	PL1512-3801	PL1512-3802	PL1512-3803
4.6 x 50	8	—	PL1512-1801	PL1512-1802	PL1512-1803
4.6 x 250	5	PL1512-5500	PL1512-5501	—	—
4.6 x 150	5	PL1111-3500	PL1512-3501	—	—
4.6 x 50	5	PL1512-1500	PL1512-1501	PL1512-1502	PL1512-1503
4.6 x 150	3	PL1512-3300	PL1512-3301	—	—
4.6 x 50	3	PL1512-1300	PL1512-1301	—	—
2.1 x 250	8	—	PL1912-5801	—	—
2.1 x 150	8	—	PL1912-3801	PL1912-3802	PL1912-3803
2.1 x 50	8	—	PL1912-1801	PL1912-1802	PL1912-1803
2.1 x 250	5	PL1912-5500	PL1912-5501	—	—
2.1 x 150	5	PL1912-3500	PL1912-3501	—	—
2.1 x 50	5	PL1912-1500	PL1912-1501	PL1912-1502	PL1912-1503
2.1 x 150	3	PL1912-3300	PL1912-3301	—	—
2.1 x 50	3	PL1912-1300	PL1912-1301	—	—
1.0 x 50	8	—	—	PL1312-1802	—
1.0 x 50	5	PL1312-1500	—	PL1312-1502	—
1.0 x 150	3	PL1312-3300	—	—	—
1.0 x 50	3	PL1312-1300	—	—	—
Guard Cartridge, 3.0 x 5.0 mm, 2/pk		PL1612-1801	PL1612-1801	PL1612-1801	PL1612-1801
Guard Cartridge holder for 3.0 x 5.0 mm cartridges		PL1310-0016	PL1310-0016	PL1310-0016	PL1310-0016

PLRP-S APPLICATIONS	
PORE SIZE	APPLICATION
100Å	Small molecules/peptides/oligonucleotides
300Å	Recombinant peptides/proteins
1000Å	Large proteins
4000Å	DNA/high speed

Agilent Zorbax 300Å StableBond

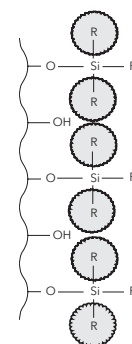
AGILENT COLUMN SPECIFICATIONS

BONDED PHASE	PORE SIZE	SURFACE AREA	TEMP LIMITS*	pH RANGE*	ENDCAPPED	CARBON LOAD
ZORBAX 300SB-C18	300Å	45 m ² /g	90 °C	1.0-8.0	No	2.8%
ZORBAX 300SB-C8	300Å	45 m ² /g	80 °C	1.0-8.0	No	1.5%
ZORBAX 300SB-C3	300Å	45 m ² /g	80 °C	1.0-8.0	No	1.1%
ZORBAX 300SB-CN	300Å	45 m ² /g	80 °C	1.0-8.0	No	1.2%
ZORBAX 300-Diphenyl	300Å	45 m ² /g	80 °C	1.0-8.0	Yes	1.9%

Specifications represent typical values only

*300StableBond columns are designed for optimal use at low pH. At pH 6-8, highest column stability for all silica-based columns is obtained by operating at temperatures <40 °C and using low buffer concentrations in the range of 0.01-0.02 M.

At mid or high pH, 300Extend-C18 is recommended



Sterically Protected StableBond Bonded Phase

DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	300SB-C18 USP L1	300SB-C8 USP L7	300SB-CN USP L10	300SB-C3 USP L56	300-DIPHENYL USP L11
Semi-Preparative	9.4 x 250	5	880995-202	880995-206	880995-205	880995-209	—
Guard Cartridge, 2/pk	9.4 x 15	7	820675-124	820675-124	820675-124	820675-124	—
Guard Hardware Kit			840140-901	840140-901	840140-901	840140-901	—
Analytical	4.6 x 250	5	880995-902	880995-906	880995-905	880995-909	—
Analytical	4.6 x 150	5	883995-902	883995-906	883995-905	883995-909	—
Analytical	4.6 x 50	5	860950-902	860950-906	860950-905	860950-909	—
Rapid Resolution	4.6 x 150	3.5	863973-902	863973-906	863973-905	863973-909	—
Rapid Resolution	4.6 x 100	3.5	861973-902	861973-906	—	—	—
Rapid Resolution	4.6 x 50	3.5	865973-902	865973-906	865973-905	865973-909	—
Guard Cartridge, 4/pk	4.6 x 12.5	5	820950-921	820950-918	820950-923	820950-924	—
Guard Hardware Kit			820999-901	820999-901	820999-901	820999-901	—
Solvent Saver Plus	3.0 x 150	3.5	863974-302	863974-306	—	863974-309	—
Solvent Saver Plus	3.0 x 100	3.5	—	861973-306	—	—	—
Guard Cartridge, 4/pk	4.6 x 12.5	5	820950-921	820950-918	820950-923	820950-924	—
Guard Hardware Kit			820999-901	820999-901	820999-901	820999-901	—
Narrow Bore	2.1 x 250	5	881750-902	—	—	—	—
Narrow Bore	2.1 x 150	5	883750-902	883750-906	883750-905	883750-909	—
Narrow Bore RR	2.1 x 150	3.5	—	863750-906	—	—	—
Narrow Bore RR	2.1 x 100	3.5	861775-902	861775-906	—	—	—
Narrow Bore RR	2.1 x 50	3.5	865750-902	865750-906	—	—	—
Narrow Bore RRHD	2.1 x 100	1.8	858750-902	858750-906	—	858750-909	858750-944
Narrow Bore RRHD	2.1 x 50	1.8	857750-902	857750-906	—	857750-909	857750-944
Guard Cartridge, 4/pk	2.1 x 12.5	5	821125-918	821125-918	821125-924	821125-924	—
Guard Hardware Kit			820999-901	820999-901	820999-901	820999-901	—
MicroBore	1.0 x 250	5	861630-902	—	—	—	—
MicroBore RR	1.0 x 150	3.5	863630-902	863630-906	—	—	—
MicroBore RR	1.0 x 50	3.5	865630-902	865630-906	—	—	—
MicroBore Guard, 3/pk	1.0 x 17	5	5185-5920	5185-5920	—	—	—

Agilent AdvanceBio SEC

- The latest technology for Size Exclusion Chromatography (SEC) analysis of monoclonal antibodies, proteins, and peptides

DESCRIPTION	130Å	300Å
ANALYTICAL COLUMNS		
7.8 x 300 mm, 2.7 µm	PL1180-5350	PL1180-5301
7.8 x 150 mm, 2.7 µm	PL1180-3350	PL1180-3301
4.6 x 300 mm, 2.7 µm	PL1580-5350	PL1580-5301
4.6 x 150 mm, 2.7 µm	PL1580-3350	PL1580-3301
ANALYTICAL GUARDS		
7.8 x 50 mm, 2.7 µm	PL1180-1350	PL1180-1301
4.6 x 50 mm, 2.7 µm	PL1580-1350	PL1580-1301

Agilent AdvanceBio SEC is not recommended for MS applications, see next page for Agilent Bio SEC-3.

AGILENT AdvanceBio SEC PROTEIN STANDARDS		
DESCRIPTION	SIZE	PART NO
130Å	1.5 mL vial	5190-9416
300Å	1.5 mL vial	5190-9417

AdvanceBio SEC SPECIFICATIONS		
PORE SIZE (Å)	PARTICLE SIZE (µm)	PROTEIN MW RANGE (Da)
130	2.7	100 – 100,000
300	2.7	5000 – 1,250,000



Agilent ProSEC 300S

- ProSEC 300S columns are designed as a single column solution for globular protein analysis
- Mechanically robust silica particles that do not bleed during use
- Extended linear resolving range eliminates the need for pore size selection—a single column to analyze most globular proteins
- Choices to help you perfect your separation—Two column IDs to suit multi-detector SEC
- Increased sensitivity when used with light-scattering detectors, to identify dimers, trimers, and aggregates

DESCRIPTION	100Å
ANALYTICAL COLUMNS	
7.5 x 600 mm, 5 µm	PL1147-8501
7.5 x 300 mm, 5 µm	PL1147-6501
4.6 x 250 mm, 5 µm	PL1547-5501
ANALYTICAL GUARDS	
7.5 x 50 mm, 5 µm	PL1147-1501
4.6 x 50 mm, 5 µm	PL1547-1501

ProSec 300S SPECIFICATIONS		
PORE SIZE	PARTICLE SIZE	PROTEIN MW RANGE
300Å	5 µm	1,500 – 800,000 Da
pH RANGE		
2 – 7.5		
FLOW RATE		
<1.5 (7.5 mm ID) mL/min; <0.5 (4.6 mm ID) mL/min		
TYPICAL OPERATING PRESSURE		
250 bar (3700 PSI)		

Agilent Bio SEC-3

- Agilent Bio SEC-3 HPLC columns for protein analysis with MS detection
- Compatibility with denaturing organic/aqueous mobile phases used for SEC-MS
- Excellent stability with both high and low-salt conditions
- Scalability from analytical to preparative workflows

DESCRIPTION	100Å	150Å	300Å
ANALYTICAL COLUMNS			
7.8 x 300 mm, 3 µm	5190-2501	5190-2506	5190-2511
7.8 x 150 mm, 3 µm	5190-2502	5190-2507	5190-2512
4.6 x 300 mm, 3 µm	5190-2503	5190-2508	5190-2513
4.6 x 150 mm, 3 µm	5190-2504	5190-2509	5190-2514
ANALYTICAL GUARDS			
7.8 x 50 mm, 3 µm	5190-2505	5190-2510	5190-2515
4.6 x 50 mm, 3 µm	5190-6846	5190-6847	5190-6848
PREP COLUMNS			
21.2 x 300 mm, 3 µm	5190-6850	5190-6851	5190-6852
PREP GUARDS			
21.2 x 50 mm, 3 µm	5190-6854	5190-6855	5190-6856

AGILENT Bio SEC-3 SPECIFICATIONS		
PORE SIZE (Å)	PARTICLE SIZE (µm)	PROTEIN MW RANGE (Da)
100	3	100 – 100,000
150	3	500 – 150,000
300	3	5,000 – 1,250,000
pH RANGE		
2 – 8.5		
FLOW RATE		
0.1 – 1.25 (7.8 mm ID) mL/min; 0.1 – 0.4 (4.6 mm ID) mL/min		
TYPICAL OPERATING PRESSURE		
103 bar (1500 PSI)		

Agilent Bio SEC-5

- Agilent Bio SEC-5 HPLC columns are for large biomolecules and samples with multiple molecular weight components
- Exceptional resolution for large molecules
- High stability and efficiency due to a proprietary neutral hydrophilic layer
- Improved peak capacity and resolution due to specially designed packing that increases pore volume
- Rugged performance—Outstanding reproducibility and column lifetime
- Excellent stability, even under high-pH, high-salt, and low-salt conditions
- Flexible method development compatible with most aqueous buffers
- Broad applicability—Up to 2000Å pore size for vaccines and high molecular weight biomolecules

DESCRIPTION	100Å	150Å	300Å	500Å	1000Å	2000Å
ANALYTICAL COLUMNS						
7.8 x 300 mm, 5 µm	5190-2516	5190-2521	5190-2526	5190-2531	5190-2536	5190-2541
7.8 x 150 mm, 5 µm	5190-2517	5190-2522	5190-2527	5190-2532	5190-2537	5190-2542
4.6 x 300 mm, 5 µm	5190-2518	5190-2523	5190-2528	5190-2533	5190-2538	5190-2543
4.6 x 150 mm, 5 µm	5190-2519	5190-2524	5190-2529	5190-2534	5190-2539	5190-2544
ANALYTICAL GUARDS						
7.8 x 50 mm, 5 µm	5190-2520	5190-2525	5190-2530	5190-2535	5190-2540	5190-2545
4.6 x 50 mm, 5 µm	5190-6857	5190-6858	5190-6859	5190-6860	5190-6861	5190-6862
PREP COLUMNS						
21.2 x 300 mm, 5 µm	5190-6863	5190-6864	5190-6865	5190-6866	5190-6867	5190-6868
PREP GUARDS						
21.2 x 50 mm, 5 µm	5190-6869	5190-6870	5190-6871	5190-6872	5190-6873	5190-6874

AGILENT Bio SEC-5 SPECIFICATIONS		
PORE SIZE (Å)	PARTICLE SIZE (µm)	PROTEIN MW RANGE (Da)
100	5	100 – 100,000
150	5	500 – 150,000
300	5	5,000 – 1,250,000
500	5	15,000 – 2,000,000
1000	5	50,000 – 7,500,000
2000	5	>10,000,000
pH RANGE		
2 – 8.5		
FLOW RATE		
0.1 – 1.25 (7.8 mm ID) mL/min; 0.1 – 0.4 (4.6 mm ID) mL/min		
TYPICAL OPERATING PRESSURE		
103 bar (1500 PSI)		

Recommendations for setting up a GPC/SEC system

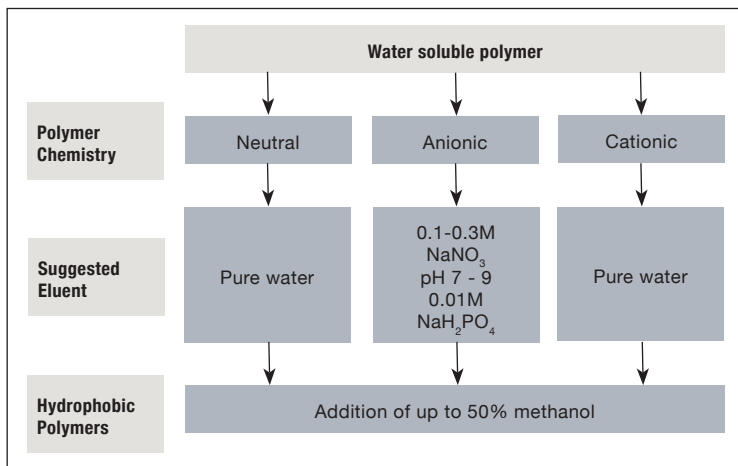
QUESTION	ANSWER	RECOMMENDATION	COMMENTS
CHOOSING AN ELUENT FOR GPC/SEC			
<p>1. <i>What is the sample soluble in?</i></p> <p>Many polymers are only soluble in a small number of solvents. This is the key question when developing methods for analyzing polymers. The solvents mentioned here are all common eluents employed in GPC/SEC</p>	Water or water buffer with up to 50% methanol	Agilent PL aquagel-OH	Best choice for water-based applications but cannot accommodate organics apart from methanol up to 50%
	Organic/water mixtures or polar organics such as, DMF, NMP	Agilent PolarGel	PolarGel is a smaller column range than PLgel or PL aquagel-OH columns but is suited to mixtures of organics and water
	Typical organic solvent such as THF, chloroform, toluene	Agilent PLgel or Agilent PlusPore	PLgel are the workhorse columns, PlusPore columns are an alternative
CHOOSING A COLUMN FOR AQUEOUS/MIXED SOLVENT GPC/SEC			
<p>2. <i>What is the expected molecular weight?</i></p> <p>It may seem strange to ask this question, but in GPC/SEC the resolution of a column is related to the resolving range. Knowing something of the expected molecular weight of a sample helps to choose the best column that will give optimum results.</p>	High (up to several millions)	Aqueous solvents: PL aquagel-OH MIXED-H 8 µm or combination of PL aquagel-OH 40 and 60 15 µm	The 15 µm column combination is best only where sample viscosity is very high, otherwise 8 µm columns give greater resolution
	Intermediate (up to hundreds of thousands)	Aqueous solvents: PL aquagel-OH MIXED-M 8 µm	A wide-ranging column that covers most water-soluble polymers
		Mixed solvents: PolarGel-M	Covers most applications
	Low (up to tens of thousands)	Aqueous solvents: Combination of PL aquagel-OH 40 and PL aquagel-OH 30 8 µm	These two columns in a combined set cover the low end of the molecular weight range
		Mixed solvents: PolarGel-L	For low molecular weight applications
	Very low (a few thousand)	Aqueous solvents: PL aquagel-OH 20 5 µm	This high-performance column give high resolution at low molecular weight
Mixed solvents: PLgel		No PolarGel column covers this range so use PLgel columns as alternatives	
Unknown	Aqueous solvents: PL aquagel-OH MIXED-M 8 µm	Covers the molecular weight ranges of ww polymer samples	
	Mixed solvents: PolarGel-M	Covers the majority of applications	
CHOOSING A COLUMN FOR ORGANIC GPC/SEC			
<p>2. <i>What is the expected molecular weight?</i></p> <p>It may seem strange to ask this question, but in GPC/SEC the resolution of a column is related to the resolving range. Knowing something of the expected molecular weight of a sample helps to choose the best column that will give optimum results.</p> <p>Columns shown in bold are the best initial choice.</p>	High (up to several millions)	PLgel 10 µm MIXED-B or PLgel 20 µm MIXED-A	The PLgel MIXED-A column resolves higher than the PLgel MIXED-B but at lower efficiency due to larger particle size
	Intermediate (up to hundreds of thousands)	PLgel 5 µm MIXED-C or PLgel 5 µm MIXED-D, PolyPore or ResiPore	The PLgel columns are the most widely applicable for the majority of applications; PolyPore and ResiPore columns are alternatives
	Low (up to tens of thousands)	PLgel 3 µm MIXED-E or MesoPore	The PLgel column provides high resolution and is designed for low molecular weight applications
	Very low (a few thousand)	OligoPore or PLgel 3 µm 100Å	The OligoPore column offers the best possible oligomer separation, PLgel also works well
	Unknown	PLgel 5 µm MIXED-C or PolyPore	This PLgel column is the most widely applicable for the majority of applications
SETTING UP THE GPC/SEC SYSTEM			
<p>3. <i>How many columns to use?</i></p> <p>The greater the particle size of the media in the column (which is dependent on the expected molecular weight of the samples), the lower the resolution and the more columns are required to maintain the quality of the results.</p>	Depends on the particle size of the columns	Particle size 20 µm use 4 columns	Increased number of columns required for large particle sizes to make up for low efficiencies. For higher molecular weight samples, larger particles are necessary to reduce the danger of shear degradation of samples during analysis.
		Particle size 13 µm use 3 columns	
		Particle size 10 µm use 3 columns	
		Particle size 8 µm use 2 columns	
		Particle size 5 µm use 2 columns	
		Particle size 3 µm use 2 columns	
<p>4. <i>What size injection volume?</i></p> <p>The injection volume required is dependent on the particle size of the column. Smaller particle sizes require smaller loops to minimize band broadening</p>	Depends on the particle size of the columns	Particle size 20 µm — 200 µL injection	Smaller particles need lower injection volumes to minimize dead volume. Larger injection volumes allow the introduction of high molecular weight samples at lower concentrations, reducing viscosity and ensuring a quality chromatogram is obtained
		Particle size 13 µm — 200 µL injection	
		Particle size 10 µm — 200 µL injection	
		Particle size 5 µm — 100 – 200 µL inj.	
		Particle size 3 µm — 20 µL injection	

Agilent PL aquagel-OH SEC columns

- ➔ Highly stable matrix ensures reliable separations even with modified eluents
- ➔ MIXED columns cover a wide spread of molecular weights, simplifying column selection
- ➔ Highly versatile for neutral, polar, anionic and cationic samples

TECH TIP

When using a set of columns containing different pore sizes, put the highest pore size first to reduce the viscosity in the system as early as possible to improve column lifetimes



Guide to eluent selection for PL aquagel-OH applications

AGILENT PL AQUAGEL-OH COLUMN SELECTION GUIDE

SAMPLE TYPE	TYPICAL APPLICATIONS	RECOMMENDED COLUMN SETS
Low MW polymers and oligomers	Surfactants, oligosaccharides, PEGs, lignosulfonates, polyacrylates	Set of 2 or 3 PL aquagel-OH 30/20 PL aquagel-OH 8 μm, or PL aquagel-OH 20 5 μm, or PL aquagel-OH MIXED-M 8 μm
Polydisperse synthetic or naturally occurring polymers	Polysaccharides, PVA, cellulose derivatives, PEO, polyacrylic acid	2 or 3 PL aquagel-OH MIXED-H 8 μm, or PL aquagel-OH 60/50/40 8 μm
Very high MW polymers	Polyacrylamides, hyaluronic acids, CMC, starches, gums	PL aquagel-OH 60/50/40 15 μm in series

AGILENT PL AQUAGEL-OH COLUMNS

PART NO	DESCRIPTION	PARTICLE SIZE (μm)	MW RANGE (g/mol) (PEG/PEO)	EFFICIENCY (p/m)
PL AQUAGEL-OH COLUMNS 7.5 x 300 mm				
PL1120-6520	PL aquagel-OH 20	5	100 – 20,000	>55,000
PL1120-6830	PL aquagel-OH 30	8	100 – 60,000	>35,000
PL1149-6840	PL aquagel-OH 40	8	10,000 – 200,000	>35,000
PL1149-6240	PL aquagel-OH 40	15	10,000 – 200,000	>15,000
PL1149-6850	PL aquagel-OH 50	8	50,000 – 600,000	>35,000
PL1149-6250	PL aquagel-OH 50	15	50,000 – 600,000	15,000
PL1149-6860	PL aquagel-OH 60	8	200,000 – 10,000,000	>35,000
PL1149-6260	PL aquagel-OH 60	15	200,000 – 10,000,000	>15,000
PL1149-6800	PL aquagel-OH Mixed-H	8	6,000 – 10,000,000	>35,000
PL1149-6801	PL aquagel-OH Mixed-M	8	1,000 – 500,000	>35,000
PL AQUAGEL-OH PREPARATIVE COLUMNS 8 μm, 25 x 300 mm				
PL1220-6130	PL aquagel-OH 30	8	100 – 60,000	
PL1249-6140	PL aquagel-OH 40	8	10,000 – 200,000	
PL1249-6150	PL aquagel-OH 50	8	50,000 – 600,000	
PL1249-6100	PL aquagel-OH MIXED	8	6,000 – 10,000,000	
PL1249-1120	PL aquagel-OH Guard, 25 x 25 mm	8		
PL AQUAGEL-OH GUARD COLUMNS				
PART NO	DESCRIPTION	PARTICLE SIZE (μm)	ID (mm)	LENGTH (mm)
PL1249-1120	PL aquagel-OH Guard	10	25.0	25
PL1149-1530	PL aquagel-OH Guard	5	7.5	50
PL1149-1840	PL aquagel-OH Guard	8	7.5	50

Agilent PolarGel GPC Columns

Agilent PolarGel-L GPC Columns

For analysis of low molecular weight polymers in polar solvents

- ➔ Specifically designed for polar samples
- ➔ Mixed bed technology delivers near linear calibrations for greater accuracy
- ➔ Mechanical stability for longer column lifetimes

Agilent PolarGel-M GPC Columns

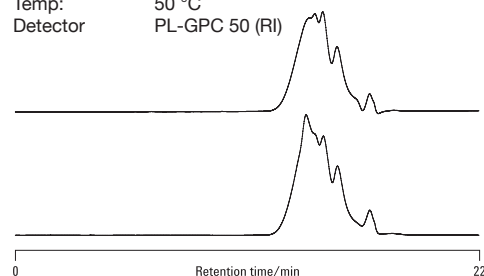
For analyzing a wide range of polymers in polar solvents

- ➔ Optimized pore size distribution and particle size for superior resolution
- ➔ Mixed bed technology simplifies column selection
- ➔ No sample and stationary phase interaction for accurate MW measurement

AGILENT POLARGEL GPC COLUMNS	
PART NO	DESCRIPTION
POLARGEL-L GPC COLUMNS	
PL1117-6830	PolarGel-L, 7.5 x 300 mm
PL1310-0001	Frit Removal Tool for Threaded Columns only
PL1310-0004	End Fitting for Threaded Columns, 7.5 mm ID
PL1310-0012	Frit (5 µm) Kit for Threaded Columns, 7.5 mm ID, 5/pk
PL1310-0007	Column Connecting Nuts, 1/16", 5/pk
PL1310-0008	Tubing Ferrules, 1/16", 5/pk
PL1310-0003	Column End Plugs, 1/16", 10/pk
PL1310-0005	LDV Intercolumn SS Connector
PL1417-0830	PolarGel-L Repair Gel
PL1117-1830	PolarGel-L Guard Column, 7.5 x 50 mm
POLARGEL-M GPC COLUMNS	
PL1117-6800	PolarGel-M, 7.5 x 300 mm
PL1310-0001	Frit Removal Tool for Threaded Columns only
PL1310-0004	End Fitting for Threaded Columns, 7.5 mm ID
PL1310-0012	Frit (5 µm) Kit for Threaded Columns, 7.5 mm ID, 5/pk
PL1310-0007	Column Connecting Nuts, 1/16", 5/pk
PL1310-0008	Tubing Ferrules, 1/16", 5/pk
PL1310-0003	Column End Plugs, 1/16", 10/pk
PL1310-0005	LDV Intercolumn SS Connector
PL1417-0800	PolarGel-M Repair Gel
PL1117-1800	PolarGel-M Guard Column, 7.5 x 50 mm

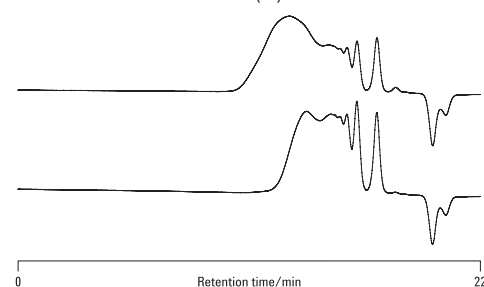
Two Samples of melamine resin analyzed by PolarGel-L

Column: 2 x Polar-Gel-L
7.5 x 300 mm
Eluent: Dimethylacetamide + 0.1% LiBr
Flow Rate: 1.0 mL/min
Inj Vol: 100 µL
Temp: 50 °C
Detector: PL-GPC 50 (RI)



Excellent separation of two phenol formaldehyde resins with PolarGel-M

Column: 2 x Polar-Gel-M
7.5 x 300 mm
Eluent: 0.2% (w/v) DMF & 0.1% LiBr to reduce sample aggregation
Flow Rate: 1.0 mL/min
Inj Vol: 100 µL
Temp: 50 °C
Detector: PL-GPC 50 (RI)



Agilent PL Rapide

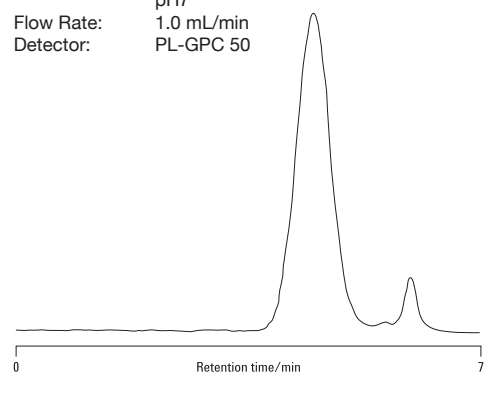
Fast separations for high turnaround or when analyzing many samples

- ➔ Analysis of water-soluble polymers in less than ten minutes saves time
- ➔ Significantly increased sample throughput improves efficiency
- ➔ Reduced solvent consumption and disposal costs saves money

AGILENT PL RAPIDE COLUMNS				
PART NO	DESCRIPTION	SIZE (mm)	MW RANGE (g/mol)	TYPICAL EFFICIENCY (p/m)
PL1149-3800	PL Rapide Aqua H	7.5 x 150	6,000 – 10,000,000	>35,000
PL1049-2800	PL Rapide Aqua H	10 x 100	6,000 – 10,000,000	>35,000
PL1120-3830	PL Rapide Aqua L	7.5 x 150	100 – 60,000	>35,000
PL1020-2830	PL Rapide Aqua L	10 x 100	100 – 60,000	>35,000

Sodium Acrylate

Column: **PL Rapide Aqua H**
7.5 x 150 mm
 Eluent: Water + 0.2 M NaNO₃, 0.01 M NaH₂PO₄, pH7
 Flow Rate: 1.0 mL/min
 Detector: PL-GPC 50



Agilent Polyethylene Glycol/Oxide Standards

- ➔ Simple-to-use kit form
- ➔ Combines glycols and oxides to extend the MW range and cover more applications
- ➔ MWs selected to provide equidistant calibration points for greater accuracy

These hydrophobic polymers are suitable for both aqueous SEC and organic GPC using the majority of polar organic solvents. The oxides are available in high molecular weights, while the glycols cover the lower molecular weight range. The two types are chemically similar so they can be used together across a wider molecular weight range, with aqueous and organic polymers from 106-1 million MW. Every kit contains 0.2 g or 0.5 g of ten different molecular weight standards.

AGILENT CALIBRATION KITS	
PEG-10 (10 x 0.5 g) PART NO PL2070-0100	PEO-10 (10 x 0.2 g) PART NO PL2080-0101
CONSTITUENT POLYMER NOMINAL MP (g/mol)	
106	20,000
194	30,000
400	50,000
600	70,000
1,000	100,000
2,000	200,000
4,000	300,000
7,000	400,000
13,000	700,000
20,000	1,000,000

INDIVIDUAL POLYMER MOLECULAR WEIGHTS		
PART NO (1 g)	POLYMER NOMINAL Mp (g/mol)	NOMINAL Mw/Mn
POLYETHYLENE GLYCOL		
PL2070-1001	106	1.00
PL2070-2001	194	1.00
PL2071-2001	238	1.00
PL2071-3001	282	1.00
PL2070-3001	420	1.09
PL2070-4001	600	1.06
PL2070-5001	1,000	1.04
PL2070-6001	1,500	1.04
PL2070-7001	4,000	1.03
PL2070-8001	7,000	1.04
PL2070-9001	10,000	1.05
PL2071-0001	13,000	1.07
PL2071-1001	20,000	1.07
POLYETHYLENE OXIDE		
PL2083-1001	20,000	1.05
PL2083-2001	30,000	1.07
PL2083-3001	50,000	1.05
PL2083-4001	70,000	1.05
PL2083-5001	100,000	1.06
PL2083-6001	130,000	1.07
PL2083-7001	200,000	1.07
PL2083-8001	300,000	1.07
PL2083-9001	500,000	1.06
PL2084-0001	700,000	1.07
PL2084-1001	1,000,000	1.12
PL2084-2001	1,500,000	1.13

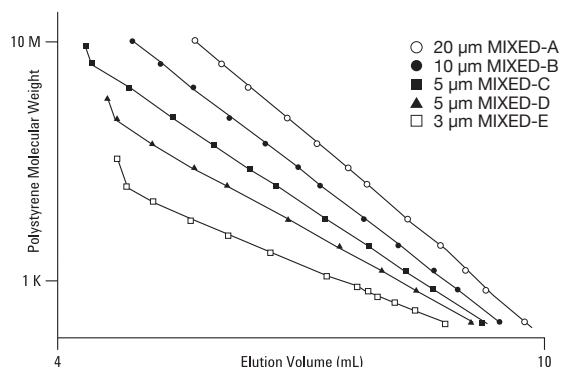
Agilent PLgel MIXED Columns

CHARACTERISTICS	PLgel 20 µm MIXED-A	PLgel 10 µm MIXED-B	PLgel 5 µm MIXED-C	PLgel 5 µm MIXED-D	PLgel 3 µm MIXED-E
Linear MW Operating Range (g/mol)	2,000 – 40,000,000 (PS equiv)	500 – 10,000,000 (PS equiv)	200 – 2,000,000 (PS equiv)	200 – 4,00,000 (PS equiv)	up – 25,000 (PS equiv)
Typical Column Efficiency (plates/meter)	>18,000 p/m	>35,000 p/m	>50,000 p/m	>50,000 p/m	7.5 x 300 mm: >80,000 p/m* 4.6 x 250 mm: >70,000 p/m*
Typical Pressure	1 mL/min (7.5 mm ID): ≈ 3 bar (44PSI) per 300 mm 0.3 mL/min (4.6 mm ID): ≈ 2.4 bar (35 PSI) per 250 mm (THF @ 20 °C, TCB @ 140 °C)	1 mL/min (7.5 mm ID): ≈ 10 bar (145 PSI) per 300 mm 0.3 mL/min (4.6 mm ID): ≈ 8 bar (116 PSI) per 240 mm (THF @ 20 °C, TCB @ 140 °C)	1 mL/min (7.5 mm ID): ≈ 30 bar (435 PSI) per 300 mm 0.3 mL/min (4.6 mm ID): ≈ 24 bar (348 PSI) per 250 mm (THF @ 20 °C, TCB @ 140 °C)	1 mL/min (7.5 mm ID): ≈ 30 bar (435 PSI) per 300 mm 0.3 mL/min (4.6 mm ID): ≈ 24 bar (348 PSI) per 250 mm (THF @ 20 °C, TCB @ 140 °C)	1 mL/min (7.5 mm ID): ≈ 50 bar (725 PSI) per 300 mm 0.3 mL/min (4.6 mm ID): ≈ 42 bar (609 PSI) per 250 mm (THF @ 20 °C)
Maximum Flow Rate	7.5 mm ID: 1.5 mL/min 4.6 mm ID: 0.5 mL/min	7.5 mm ID: 1.5 mL/min 4.6 mm ID: 0.5 mL/min	7.5 mm ID: 1.5 mL/min 4.6 mm ID: 0.5 mL/min	7.5 mm ID: 1.5 mL/min 4.6 mm ID: 0.5 mL/min	7.5 mm ID: 1.5 mL/min 4.6 mm ID: 0.5 mL/min
Maximum Pressure	150 bar (2175 PSI)	150 bar (2175 PSI)	150 bar (2175 PSI)	150 bar (2175 PSI)	180 bar (2611 PSI)
Maximum Temperature	220 °C	220 °C	150 °C	150 °C	110 °C
Recommended No. of Columns/Set	4 x 250 mm or 4 x 300 mm	3 x 250 mm or 3 x 300 mm	2 x 250 mm or 2 x 300 mm	2 x 250 mm or 2 x 300 mm	1.3 x 250 mm or 1-3 x 300 mm
Recommended Calibrants	EasiVial PS-H for convenient 12 point calibration in just three injections EasiCal PS-1 or S-H2-10 Kit provides rapid 10 point calibration S-H-10 plus S-M2-10 Kits for accurate 19 point calibration See publication 5990-7996EN, GPC/SEC Standards Product Guide	The EasiVial PS-H for convenient 12 point calibration in just three injections EasiCal PS-1 or S-H2-10 Kit provides rapid 10 point calibration Polystyrene S-H-10 plus S-M2-10 Kits for accurate 19 point calibration See publication 5990-7996EN, GPC/SEC Standards Product Guide See also: PLgel MiniMIX-B Narrow Bore Columns, reduce the need for expensive solvents	The EasiVial PS-H for convenient 10 point calibration in just three injections EasiCal PS-1 provides rapid 10 point calibration Polystyrene Kit S-M-10 for accurate 10 point calibration Polyethylene Oxide/Glycol PEO/PEG-10 Kits for DMF, chemically similar for a broad MW range See publication 5990-7996EN, GPC/SEC Standards Product Guide	The EasiVial PS-M for convenient 12 point calibration in just three injections EasiCal PS-2 provides rapid 10 point calibration Polystyrene Kit S-M2-10 for accurate 10 point calibration Polyethylene Oxide/Glycol PEO/PEG-10 Kits for DMF, chemically similar for a broad MW range See publication 5990-7996EN, GPC/SEC Standards Product Guide	Polystyrene Kit S-L-10 for accurate 10 point calibration Polyethylene Glycol Kit PEG-10 for DMF, for low molecular weights See publication 5990-7996EN, GPC/SEC Standards Product Guide

*Highest efficiency/resolution achieved only on high performance, low dead volume equipment.

SIZE	PLGEL 20 µm MIXED-A	PLGEL 10 µm MIXED-B	PLGEL 5 µm MIXED-C	PLGEL 5 µm MIXED-D	PLGEL 3 µm MIXED-E
7.5 x 300 mm	PL1110-6200	PL1110-6100	PL1110-6500	PL1110-6504	PL1110-6300
4.6 x 250 mm	PL1510-5200	PL1510-5100	PL1510-5500	PL1510-5504	PL1510-5300
Guard, 7.5 x 50 mm	PL1110-1220	PL1110-1120	PL1110-1520	PL1110-1520	PL1110-1320
PMiniMIX Guard, 4.6 x 50 mm	PL1510-1200	PL1510-1100	PL1510-1500	PL1510-1504	PL1510-1300

PLgel MIXED Gel Calibration Curves



PLgel MIXED gel column selection guide

UHMW polymer distributions	PLgel 20 µm MIXED-A
High MW polymers, demanding eluents	PLgel 10 µm MIXED-B
Mid range MW polymers, high resolution	PLgel 5 µm MIXED-C
Resins, condensation polymers	PLgel 5 µm MIXED-D
Low MW resins, prepolymers	PLgel 3 µm MIXED-E

10² 10³ 10⁴ 10⁴ 10⁶ 10⁷

Agilent PLgel MIXED LS

- Eliminates particle leakage to improve data quality with light scattering detection

AGILENT PLgel MIXED-LS COLUMNS				
PART NO	DESCRIPTION	SIZE	LINEAR MW OPERATING RANGE (g/mol) (PS)	TYPICAL EFFICIENCY (p/m)
PL1110-6100LS	PLgel 10 µm MIXED-B LS,	7.5 x 300 mm	500 – 10,000,000	>35,000
PL1110-6200LS	PLgel 20 µm MIXED-A LS	7.5 x 300 mm	2,000 – 10,000,000	>18,000
PL1110-1120	PLgel 10 µm Guard	7.5 x 50 mm		
PL1110-1220	PLgel 20 µm Guard	7.5 x 50 mm		

Agilent PLgel MiniMIX Narrow Bore

- Use about 70% less solvent and save money
- Store less solvent and increase operator safety
- High performance comparable to Agilent's conventional ID columns

AGILENT PLgel MINIMIX NARROW BORE 4.6 X 250 mm				
PART NO	DESCRIPTION	LINEAR MW OPERATING RANGE (g/mol) (PS)	TYPICAL EFFICIENCY (p/m)	
PL1510-5200	PLgel 20 µm MiniMIX-A	2,000 – 40,000,000	>17,000	
PL1510-5100	PLgel 10 µm MiniMIX-B	500 – 10,000,000	>35,000	
PL1510-5500	PLgel 5 µm MiniMIX-C	200 – 2,000,000	>50,000	
PL1510-5504	PLgel 5 µm MiniMIX-D	200 – 400,000	>50,000	

TECH TIP

To maintain the same linear velocity through the columns, the volumetric flow rate must be reduced to 0.3 mL/min in line with the column cross section area, resulting in significantly lower solvent consumption. Sample loading should also be scaled down in line with reduced column volume, and system dead volume should be minimized to avoid excessive band broadening.

Reduce the size of peaks when using a refractive index detector by preparing the samples in the eluent that is flowing in the system.

Agilent PLgel Olexis Columns

- Analyzing polymers of very high molecular weight
- Optimized design for polyolefin analysis
- High temperature capability
- High resolution with no damage from sample shear provides clean separations

AGILENT PLGEL OLEXIS COLUMNS		
PART NO	DESCRIPTION	SIZE
PL1110-6400	PLgel Olexis	7.5 x 300 mm
PL1110-1400	PLgel Olexis Guard	7.5 x 50 mm

TECH TIP

Remember to heat and cool columns for high temperature analysis slowly to avoid damage from thermal shock.

Agilent PLgel Individual Pore Size & Preparative Columns

Typical applications

- ➔ PLgel 3 μm : Triglycerides, linear hydrocarbons
- ➔ PLgel 5 μm : Acrylates
- ➔ PLgel 10 μm : Rubbers

SELECT YOUR PLGEL PREPARATIVE COLUMN

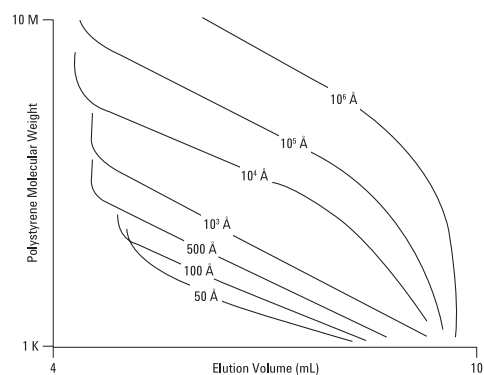
COLUMN ID (mm)	COLUMN VOLUME PER 300 mm LENGTH (mL)	MINIMUM SCALE UP
PLgel 7.5 Analytical	13	x1
PLgel 25 Preparative	147	x11

AGILENT PLGEL INDIVIDUAL PORE SIZE & PREPARATIVE COLUMNS

PART NO	DESCRIPTION	PORE SIZE (\AA)	MW RANGE (g/mol) (PS)	TYPICAL EFFICIENCY (p/m)
PLgel INDIVIDUAL PORE SIZE COLUMNS 7.5 X 300 mm				
PL1110-6320	PLgel 3 μm	100	up to 5,000	>100,000
PL1110-1320	PLgel 3 μm Guard			
PL1110-6515	PLgel 5 μm	50	up to 1,500	>60,000
PL1110-6520	PLgel 5 μm	100	up to 5,000	>60,000
PL1110-6525	PLgel 5 μm	500	500 – 25,000	>60,000
PL1110-6530	PLgel 5 μm	10^3	500 – 60,000	>50,000
PL1110-6540	PLgel 5 μm	10^4	10,000 – 450,000	>50,000
PL1110-6550	PLgel 5 μm	10^5	60,000 – 1,700,000	>50,000
PL1110-1520	PLgel 5 μm Guard			
PL1110-6115	PLgel 10 μm	50	up to 1,500	>35,000
PL1110-6120	PLgel 10 μm	100	up to 5,000	>35,000
PL1110-6125	PLgel 10 μm	500	500 – 25,000	>35,000
PL1110-6130	PLgel 10 μm	10^3	500 – 60,000	>35,000
PL1110-6140	PLgel 10 μm	10^4	10,000 – 450,000	>35,000
PL1110-6150	PLgel 10 μm	10^5	60,000 – 1,700,000	>35,000
PL1110-6160	PLgel 10 μm	10^6	600,000 – 10,000,000	>35,000
PL1110-1120	PLgel 10 μm Guard			
PL1110-1220	PLgel 20 μm Guard			
PLgel PREPARATIVE COLUMNS 25 X 300 mm				
PL1210-6115	PLgel 10 μm	50	up to 1,500	
PL1210-6120	PLgel 10 μm	100	up to 5,000	
PL1210-6125	PLgel 10 μm	500	500 – 25,000	
PL1210-6130	PLgel 10 μm	10^3	500 – 60,000	
PL1210-6140	PLgel 10 μm	10^4	10,000 – 550,000	
PL1210-6150	PLgel 10 μm	10^5	60,000 – 1,700,000	
PL1210-6160	PLgel 10 μm	10^6	600,000 – 10,000,000	
PL1210-6100	PLgel 10 μm MIXED-B		500 – 10,000,000	
PL1210-6104	PLgel 10 μm MIXED-D		200 – 400,000	
PL1210-1120	PLgel Prep Guard, 25 x 25 mm			

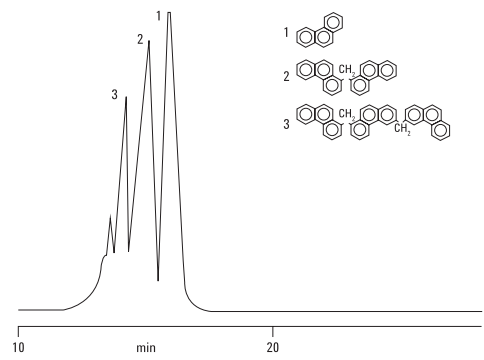
Calibration Curves

Calibrant: Polystyrene
 Eluent: TFH
 Flow Rate: 1.0 mL/min



Fractionation of an Oil Distillate

Column: PLgel 10 μm 500 \AA
 25 x 300 mm
 Sample Cone: 100 mg/mL, 2 mL
 Eluent: Dichloromethane
 Flow Rate: 9.0 mL/min
 Loading: 200 mg on column
 Detector: UV, 254 nm



Agilent HFIPgel Columns

Improved performance when using HFIP

- ➔ Optimized separation range delivers high performance with no artifacts
- ➔ Highly durable packing prolongs column lifetime
- ➔ Low operating pressure reduces system wear and unnecessary downtimes

Hexafluoroisopropanol (HFIP) is used as a solvent in GPC for the analysis of important industrial polymers such as polyesters, polyamides and polylactide/glycolide copolymers. For greatly improved performance in extremely polar solvents such as HFIP and trifluoroethanol, Agilent has developed novel "multipore" technology to produce PL HFIPgel, a PS/DVB packing featuring a monodisperse particle size, high pore volume and high resolution. Using PL HFIPgel avoids issues associated with conventional packing and HFIP, such as excessive curvature of calibration curves, dislocations/shoulders on peaks for polydisperse samples and poor resolution in the low MW region.

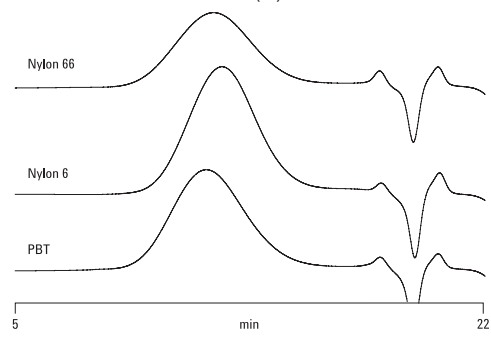
Column efficiency is typically >30,000 plates/meter and the columns are very durable, with a maximum operating pressure of 145 bar (2030 PSI). They are packed and tested in methanol, but shipped ready to use in HFIP.

PL HFIPgel columns with 7.5 mm ID normally operate at 1 mL/min. However, the 4.6 mm ID columns run at 0.3 mL/min, providing a 70% reduction in solvent consumption with savings in the cost of buying and disposing of solvents.

AGILENT HFIPgel COLUMNS		
PART NO	DESCRIPTION	SIZE
PL1514-5900HFIP	PL HFIPgel	4.6 x 250 mm
PL1114-6900HFIP	PL HFIPgel	7.5 x 300 mm
PL1114-1900HFIP	PL HFIPgel Guard	7.5 x 50 mm
PL1514-1900HFIP	PL HFIPgel Guard	4.6 x 50 mm

Polyamides

Column: 2 x PL HFIPgel
7.5 x 300 mm
Eluent: HFIP + 20mM NaTFAc
Flow Rate: 1.0 mL/min
Temp: 40 °C
Detector: PL-GPC 50 (RI)



TECH TIP

Sharp peaks at the front end of GPC/SEC chromatograms (high molecular weight), indicate the sample may be excluding and a column set with a higher resolving range may be required.

Agilent PL Rapide Columns

Fast separations for high turnaround or when analyzing many samples.

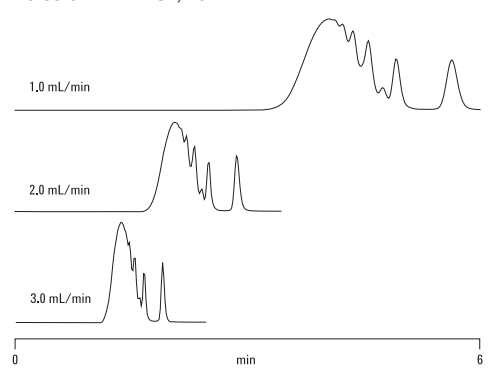
Rapid GPC is an excellent tool for screening polymer MWD for trend analysis. Short PL Rapide columns reduce analysis times while maintaining the excellent solvent compatibility and mechanical stability of all GPC columns from Agilent. PL Rapide columns are ideal for high speed applications such as high throughput screening, process monitoring, or tracking changes in MW distributions, where time is the most critical factor in the analysis.

PL Rapide is available in low (L), medium (M) and high (H) molecular weights. The F version is for flow injection analysis.

AGILENT PL RAPIDE COLUMNS				
PART NO	DESCRIPTION	SIZE (mm)	MW RANGE (g/mol)	TYPICAL EFFICIENCY (p/m)
PL1113-3100	PL Rapide H	7.5 x 150	500 – 10,000,000	>35,000
PL1013-2100	PL Rapide H	10 x 100	500 – 10,000,000	>35,000
PL1113-3500	PL Rapide M	7.5 x 150	200 – 2,000,000	>60,000
PL1013-2500	PL Rapide M	10 x 100	200 – 2,000,000	>60,000
PL1113-3300	PL Rapide L	7.5 x 150	200 – 500,000	>80,000
PL1013-2300	PL Rapide L	10 x 100	200 – 500,000	>80,000
PL1113-3120	PL Rapide F	7.5 x 150	up to 3,300	>55,000
PL1013-2120	PL Rapide F	10 x 100	up to 3,300	>40,000

Resin Analysis by Rapid GPC

Column: PL Rapide L
10 x 100 mm
Sample: Epoxy resin
Eluent: THF
Flow Rate: 1.0, 2.0 and 3.0 mL/min
Detector: UV, 254 nm



Agilent PlusPore Columns

Typical applications for the PlusPore range:

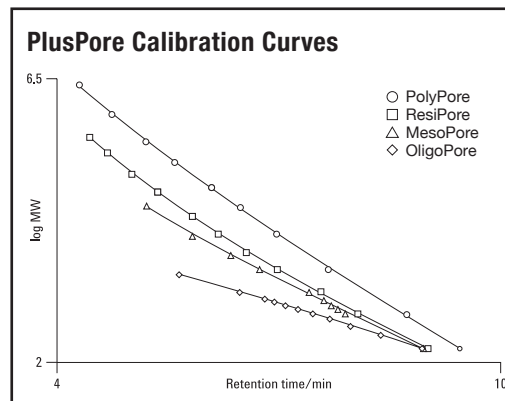
- ➔ **PolyPore** for the routine analysis of general polymers
- ➔ **ResiPore** for high resolutions of resins and condensation polymers
- ➔ **MesoPore** for unsurpassed separation of prepolymers and low MW resins
- ➔ **OligoPore** for excellent resolution of oligomeric samples

AGILENT PLUSPORE SELECTION GUIDE

COLUMN	MW RANGE (g/mol) (PS)	NOMINAL PARTICLE SIZE (µm)	TYPICAL EFFICIENCY (p/m)	RECOMMENDED CALIBRANTS*	FRIT POROSITY (µm)
PolyPore	200 – 2,000,000	5	>60,000	EasiCal PS-1 or EasiVial PS-H	2
ResiPore	up to 500,000	3	>80,000	EasiCal PS-2 or EasiVial PS-M	2
MesoPore	up to 25,000	3	>80,000	Polystyrene S-L-10 Kit	2
OligoPore	up to 3,300	6	>55,000	Polystyrene S-L2-10 Kit	2

*See page 93 for recommendations

SIZE (mm)	POLYPORE	RESIPORE	MESOPORE	OLIGOPORE
25 x 300	—	—	—	PL1213-6520
7.5 x 300	PL1113-6500	PL1113-6300	PL1113-6325	PL1113-6520
4.6 x 250	PL1513-5500	PL1513-5300	PL1513-5325	PL1513-5520
Guard, 4.6 x 50	PL1513-1500	PL1513-1300	—	PL1513-1320
Guard, 7.5 x 50	PL1113-1500	PL1113-1300	PL1113-1325	PL1113-1320



Agilent EnviroPrep Columns

Environmental clean up with EPA methods

- ➔ High sample loading ensures effective trace analysis
- ➔ Simple clean-up procedure saves sample preparation costs
- ➔ Optimized particle size distribution provides high resolution

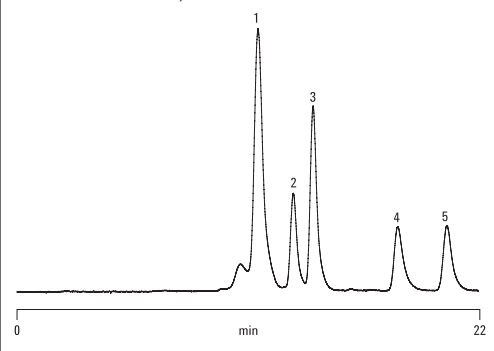
EnviroPrep columns permit a simple, one stage clean-up to determine pesticides in many organic matrices. The higher molecular weight fractions such as lipids, polymers, natural resins and dispersed high molecular weight components are easily eliminated in the GPC analysis

AGILENT ENVIROPREP COLUMNS

SIZE (mm)	PART NO
21.2 x 150	PL1E10-3120EPA
25 x 150	PL1210-3120EPA
21.2 x 300	PL1E10-6120EPA
25 x 300	PL1210-6120EPA

Columns for Sample Clean-Up

Column: EnviroPrep, 25 x 300 mm
EnviroPrep, 25 x 150 mm
Eluent: DCM
Flow Rate: 10 mL/min
Detector: UV, 254 nm



TECH TIP

Preparative GPC for soil extract clean-up is described in EPA Method 3640A using 25 x 300 mm and 25 x 150 mm columns to give higher sample loading and fraction yields, which is particularly useful for low levels of pollutants. Low pore size EnviroPrep columns are ideal for this method. The columns have 10 µm particles with 100Å pore sizes for high resolution, with an exclusion limit of 4,000 MW. The preparative columns offer good resolution and high loading through optimization of the particle size distribution.

Agilent Polystyrene Standards

- Compatible with most organic solvents
- Certificate of Analysis meets international protocols

Polystyrene standards are the first choice for many organic solvents, either for conventional GPC column calibration or for calibrating light scattering and viscosity detectors. Our organic polymers cover a range from 162-15 million MW, with MWs selected to provide equidistant calibration points for greater accuracy. Every kit contains 0.5 g of ten different molecular weight standards.

AGILENT CALIBRATION KITS, (ALL KITS 10 X 0.5 g)					
PL2010-0103	PL2010-0104	PL2010-0100	PL2010-0102	PL2010-0101	PL2010-0105
CONSTITUENT POLYMER NOMINAL MP (g/mol)					
300,000	1,000	580	580	162	162
460,000	3,000	1,450	1,400	580	370
700,000	8,600	4,000	2,400	900	580
1,100,000	25,000	10,000	4,750	1,400	800
1,700,000	73,000	27,000	9,500	2,200	1,000
2,600,000	210,000	66,000	19,000	3,400	1,500
4,000,000	600,000	180,000	38,000	5,100	1,900
6,200,000	1,780,000	460,000	75,000	8,100	2,500
9,500,000	5,000,000	1,190,000	150,000	12,800	3,200
15,000,000	15,000,000	3,000,000	300,000	20,000	4,500

INDIVIDUAL POLYMER MOLECULAR WEIGHTS			
POLYMER NOMINAL Mp (g/mol)	PART NO (1 gram)	POLYMER NOMINAL Mp (g/mol)	PART NO (1 gram)
162	PL2012-1001	100,000	PL2013-5001
370	PL2012-0001	130,000	PL2013-6001
580	PL2012-2001	200,000	PL2013-7001
1,000	PL2012-3001	300,000	PL2013-8001
1,300	PL2012-4001	500,000	PL2013-9001
2,000	PL2012-5001	700,000	PL2014-0001
3,000	PL2012-6001	1,000,000	PL2014-1001
5,000	PL2012-7001	1,500,000	PL2014-2001
7,000	PL2012-8001	2,000,000	PL2014-3001
10,000	PL2012-9001	2,500,000	PL2014-4001
20,000	PL2013-1001	4,000,000	PL2014-6001
30,000	PL2013-2001	7,000,000	PL2014-7001
50,000	PL2013-3001	10,000,000	PL2014-8001
70,000	PL2013-4001	15,000,000	PL2014-9001

Agilent EasiVial Polymer Standards

- Eliminates tedious weighing procedures to improve calibration accuracy
- Reduces solvent dispensing to limit risks associated with handling solvents
- For conventional and multi detector GPC to maximize applicability

AGILENT EASIVIAL POLYMER STANDARDS						
VOLUME	EasiVial PS-H	EasiVial PS-M	EasiVial PS-L	EasiVial PM	EasiVial PEG/PEO	EasiVial PEG
2 mL Vials (30/pk)	PL2010-0201	PL2010-0301	PL2010-0401	PL2020-0201	PL2080-0201	PL2070-0201
4 mL Vials (30/pk)	PL2010-0200	PL2010-0300	PL2010-0400	PL2020-0200	PL2080-0200	PL2070-0200
EASY VIAL KIT CONTENTS, NOMINAL MP (g/mol)						
Red Vial Cap	1,300	780	580	2,000	600	282
	20,000	6,000	3,000	30,000	12,000	1,000
	500,000	50,000	10,000	300,000	125,000	6,000
Yellow Vial Cap	6,000,000	400,000	40,000	2,000,000	1,200,000	35,000
	580	370	370	1,000	200	194
	8,500	2,500	2,000	13,000	4,000	600
	185,000	25,000	6,000	150,000	60,000	3,750
Green Vial Cap	3,000,000	200,000	25,000	800,000	1,000,000	21,000
	162	162	162	600	100	106
	3,400	1,500	1,000	5,700	1,500	420
	60,000	11,000	4,000	80,000	25,000	2,000
	900,000	100,000	16,000	470,000	460,000	12,000



Easy Vial kits contain three vials, each with a mixture of four accurately pre-weighed polymer standards, providing a 12-point GPC calibration in just three injections.

Description Key

PS: POLYSTYRENE
PM: POLYMETHYLMETHACRYLATE
PEG/PEO: POLYETHYLENE GLYCOL/OXIDE
H: HIGH
M: MEDIUM
L: LOW

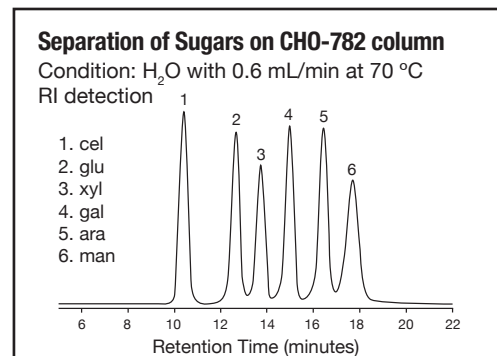
Concise Separations CARBOsep Columns for Carbohydrate Analysis

- ➔ Stable at temperatures up to 95 °C
- ➔ Consistent from column to column, and polymer batch to polymer batch
- ➔ The simplest and safest eluent of all—water
- ➔ More choices of columns utilizing combinations of cross-linkage (porosity) particle size, metal ligands and column formats to maximize your separation

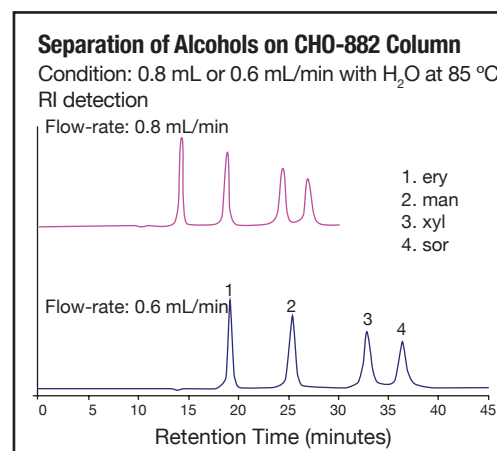
Ligand exchange is the preferred method for the separation of many sugars and sugar alcohols due to the simple water eluent. In ligand exchange, the negatively charged hydroxyl groups on the carbohydrate molecule interact with the positively charged metal loaded groups on the chromatography substrates. The carbohydrates are eluted by the polar water eluent mobile phase which competes for the sites on the metal ion. Besides the ligand exchange mechanism, several secondary mechanisms' processes are also involved in the separation of the carbohydrates including size exclusion and normal phase partitioning. HPLC columns packed with low cross-linked polymers (gels) serve as the primary packings for carbohydrate analysis columns, and are available from a number of suppliers. In order to maximize the separation of a wide variety of samples, Concise Separations has developed the most complete line of carbohydrate analysis columns available on the market by combining ligand exchange (metals), size exclusion and partitioning (cross-linkage of polymer), particle size (column efficiency) and column size (speed versus resolution).

Since polymers are chemically stable, as long as the columns are used within the operating parameters, they last a long time. The key to long column lifetime when using polymeric gels to keep the column at all times below the pressure maximum. Since temperature is a key component of pressure along with flow rate, it is extremely important to allow the column to reach temperature before starting the flow. The columns are also sensitive to water quality, so water purity is essential (minimum purity requirements 18 Mohm). Sample preparation as well as the use of guard columns and in-line filters reduce contaminants from entering the column and will extend a column's lifetime. In general, the higher the cross-linkage of the polymer and the larger the particle size, the greater the flow rate that can be used before reaching the maximum allowable pressure.

NEW CARBOsep Column Applications



Biomass Analysis



Sugar Alcohols Analysis

Tips on Maintaining the Performance of Concise Separations Columns

The most important fact to remember when using Concise Separations columns is that the polystyrene-divinylbenzene copolymer is a low cross-linked material. This polymeric packing has a limited resistance to flow rate and pressure and will irreversibly compact and overpressure the resin at a certain level. Unlike polymers, silica based materials are not flow rate sensitive and the relation between pressure and flow rate remains relatively constant. Therefore, the columns should be carefully monitored for pressure and should be operated within the recommended flow rates and pressure specifications.

- ➔ Use column ovens to serve the dual purpose of increasing efficiency and lowering back pressure.
- ➔ Set the pressure shut off for the analytical test system at or slightly below the recommended column pressure maximum to prevent irreversible damage.
- ➔ When installing, allow the column to warm up in the column oven for 15 minutes, and then start the flow rate below your target flow rate. After 15 minutes, increase the flow rate to the target flow rate and confirm that the column is operating at the expected back pressure.
- ➔ To increase the lifetime of your analytical column, we recommend the proper use of guard columns or cartridges. How frequently you change your guard column depends on pretreatment or sample purity.
- ➔ Filter and remove potentially harmful organics from the samples to decrease the need to change guard columns. Carefully monitor them for pressure increase and the chromatograms for changes in retention and efficiency to determine the approximate useful lifetime of the guard columns.

Concise Separations CARBOSEP Columns for Carbohydrate Analysis (cont.)

Retention Chart

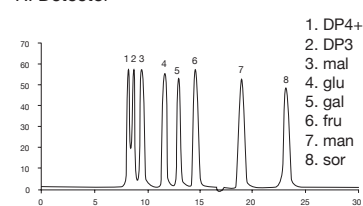
Another useful tool in choosing the best column for your sample is the use of retention charts. Compounds with at least one minute difference in retention time should be adequately separated. However, the wide variety of carbohydrates precludes developing a comprehensive chart for all compounds. Also, by using different temperature and flow rates, the selectivity of the column can be altered to enhance the separation of the compounds. If your compound does not appear in a retention chart, or the ability of a column to separate your compounds is in question, please contact Chrom Tech technical support.

RETENTION TABLE FOR CARBOSEP COLUMNS

COMPOUND	CHO-620	COREGel-87N	COREGel-87C & CHO-820	COREGel-87P & CHO-882	CHO-682	COREGel-87K
Nitrate	4.50	5.70	7.37	8.40	10.37	6.40
Maltoheptose	4.66	5.84	7.35	8.52	11.81	6.61
Maltohexose	4.78	5.94	7.45	8.80	13.31	6.74
Maltotriose	5.00	6.11	7.60	9.34	13.15	7.02
Amiprylose	-	5.74	7.75	9.46	-	6.42
Stachyose	5.94	6.33	7.85	11.84	13.48	6.32
Maltotetraose	5.37	6.42	7.87	9.84	14.14	7.02
Melezitose	5.78	6.81	8.27	13.08	13.92	7.82
Raffinose	6.56	6.88	8.31	10.22	14.47	7.92
Maltotriose	6.68	6.98	8.35	10.54	15.24	8.16
Cellobiose	7.36	7.90	9.01	10.98	15.65	9.26
Trehalose	7.32	7.85	9.14	11.20	16.05	9.02
Sucrose	7.48	7.99	9.18	11.10	15.77	9.11
Maltose	7.59	8.08	9.24	11.54	16.68	9.48
Melibiose	7.67	8.19	9.43	11.74	17.70	9.72
Lactose	7.84	8.18	9.51	11.84	17.44	9.63
Lactulose	8.53	8.48	10.24	13.24	20.77	10.08
Glucose	9.36	10.72	11.24	13.38	19.21	12.55
Lactitol	9.16	8.45	12.24	19.50	33.30	9.34
Xylose	10.31	11.77	12.39	14.42	20.71	13.69
Maltitol	9.15	8.28	12.29	17.76	30.45	9.06
Galactose	10.29	11.44	13.89	15.16	22.39	13.36
Sorbose	10.22	11.08	12.93	15.24	22.45	12.66
Mannose	10.51	11.57	12.83	16.76	25.57	13.74
Rhamnose	10.41	11.08	12.93	15.26	22.63	12.83
Fructose	11.40	11.61	13.70	16.96	25.91	13.31
Fucose	11.33	12.34	13.89	16.44	24.23	14.39
Arabinose	11.63	12.64	14.00	16.32	24.02	14.72
Myo-inositol	11.83	12.48	14.34	20.06	35.65	14.08
Digitoxose	-	12.41	14.27	-	21.02	-
Ribitol	11.95	11.26	15.62	20.44	30.79	11.84
Tagatose	-	11.86	16.53	-	-	-
Mannitol	12.76	10.81	17.89	24.98	40.10	11.42
Arabitol	13.23	11.64	18.43	25.24	39.89	12.10
Xylitol	14.61	12.16	22.00	31.10	51.22	12.64
Galactitol	14.41	11.15	20.53	31.60	52.50	11.61
Sorbitol	14.91	11.32	21.41	33.40	56.63	11.86
Ribose	46.46	11.52	21.99	28.59	55.00	14.16

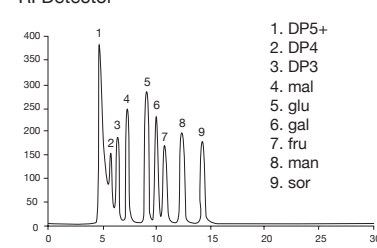
COREGel-87C-8%

Condition: 0.6 mL/min with H2O at 85 °C, RI Detector



CHO-620-6% XL

Condition: 0.5 mL/min with H2O at 90 °C, RI Detector



Resolution and Cross-linkage Effect

The lower the cross-linkage, the larger the pore size. For samples containing larger sugar polymers, the industry standard 8% cross-linked polymer may not adequately resolve your sample.

Concise Separations CARBOSep Columns for Carbohydrate Analysis (cont.)

CONCISE SEPARATIONS CARBOSEP COLUMN COMPARISON CHART					
PHASE	CROSS-LINKAGE	IONIC FORM	PARTICLE SIZE (µm)	KEY SAMPLES	COMMENTS
CHO-411 Na	4	Sodium	20	Oligosaccharides through DP10	Easier to regenerate than Ag+ form
CHO-611 Na	6	Sodium	10	Oligosaccharides through DP5, reproducible separation of corn syrup	Separates by both ligand exchange and size exclusion
CHO-611 OH Na	6	Sodium	10	Fast analysis of simple sugars	PAD detector compatible
CHO-682 Pb	6	Lead	7	High resolution column, including sucrose/maltose/lactose	Pressure sensitive, low flow rates
CHO-620 Ca	6	Calcium	10	Versatile analysis of corn syrup, sugars, sugar alcohols	Concise Separation's most popular carbohydrate column
CHO-782 Pb	7	Lead	7	Biomass sugar analysis, great for samples containing carbohydrates and sugar alcohols	Excellent selectivity with faster flow rate than the CHO682
CHO-820 Ca	8	Calcium	9	General sugar analysis	Higher efficiency version of COREGel 87C
USP L19 Ca	8	Calcium	8	Mannitol and Sorbitol - USP approved	Very rugged USP column
CHO-882 Pb	8	Lead	7	Monosaccharides and cellulose products	Higher speed, lower resolution than CHO682
CHO-882 Pb Fast	8	Lead	7	Fast analysis of monosaccharides	Quick analysis
COREGel 87C Ca	8	Calcium	9	Industry standard for analysis of general sweeteners	Compatible replacement for the Bio-Rad Aminex HPX 87C
COREGel 87C Fast	8	Calcium	9	Fast analysis of simple sugars	Quick analysis with a rugged column
COREGel 87MM Ca Na	8	Sodium/Calcium	8	Fast analysis of sugar alcohols	Easily cleaned with EDTACaNa2
COREGel 87K K	8	Potassium	9	Target application corn syrup and molasses. Sugar samples such as brewing wort, betaine analysis	Use with samples containing potassium, Compatible replacement for the Bio-Rad Aminex HPX 87K
COREGel 87N Na	8	Sodium	9	Molasses and other sugars high salt samples	Easy to regenerate, low selectivity. Compatible replacement for the Bio-Rad Aminex HPX 87N
COREGel 87P Pb	8	Lead	9	Monosaccharides and cellulose products	Less resolution than CHO882, high flow rate. Compatible replacement for the Bio-Rad Aminex HPX 87P

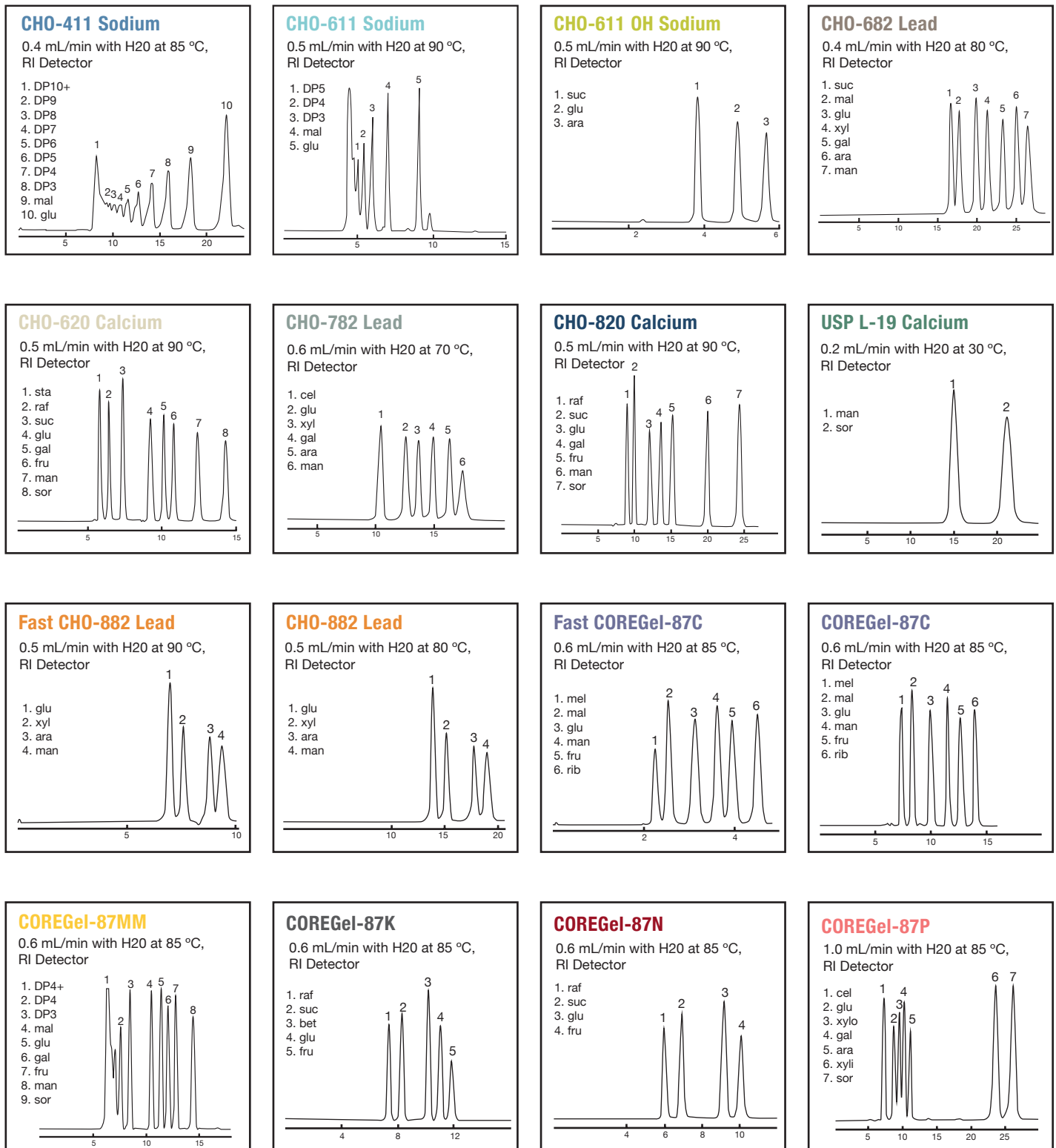
DESCRIPTION	SIZE	CHO-411 Na	CHO-611 Na Corn Syrup	CHO-611 OH Na	CHO-682 Pb	CHO-620 Ca	CHO-782 Pb Carbo & Biomass	CHO-820 Ca
Column	7.8 x 300 mm	CHO-99-9850	—	—	CHO-99-9854	—	CHO-99-7770	CHO-99-9855
Column	7.8 x 200 mm	—	—	—	CHO-99-8854	—	—	CHO-99-8855
Column	7.8 x 150 mm	—	—	—	CHO-99-9853	—	—	—
Column Column (Waters)	6.5 x 300 mm	—	CHO-99-9751	—	—	CHO-99-9753 CHO-99-9753W	—	—
Column	6.5 x 150 mm	—	—	CHO-99-7752	—	—	—	—
Guard Kit (1 holder, 2/pk cartridges)		CHO-99-2371	CHO-99-2351	CHO-99-2352	CHO-99-2354	CHO-99-2353	CHO-99-2372	CHO-99-2355
Guard Cartridges (2/pk)		CHO-99-1371	CHO-99-1351	CHO-99-1352	CHO-99-1354	CHO-99-1353	CHO-99-1372	CHO-99-1355

DESCRIPTION	SIZE	USP L-19 Ca	CHO-882 Pb	COREGel-87C Ca	COREGel-87MM Ca/Na	COREGel-87K	COREGel-87N Na	COREGel-87P Pb
Column	7.8 x 300 mm	—	CHO-99-8770	CHO-99-9860	CHO-99-9865	CHO-99-9862	CHO-99-9863	CHO-99-9864
Column (Fast)	7.8 x 150 mm	—	CHO-99-5882	—	—	—	—	—
Column (Fast)	7.8 x 100 mm	—	—	CHO-99-5860	—	—	—	—
Column	4.0 x 250 mm	CHO-99-8453	—	—	—	—	—	—
Guard Kit (1 holder, 2/pk cartridges)		CHO-99-2367	CHO-99-2373	CHO-99-2360	CHO-99-2365	CHO-99-2362	CHO-99-2363	CHO-99-2364
Guard Cartridges (2/pk)		CHO-99-1367	CHO-99-1373	CHO-99-1360	CHO-99-1365	CHO-99-1362	CHO-99-1363	CHO-99-1364

TECH TIP | Alltech 700CH

The popular Alltech 700CH (P/N: 70057) is the Concise CarboSep CHO 620 Ca (P/N: CHO-99-9753) column.

Concise Separations CARBOSep Columns for Carbohydrate Analysis (cont.)



Concise Separations Columns for Organic Acid Analysis

- Stable in the pH range of 0 to 14
- Stable at high temperatures up to 90° C
- Consistent performance through numerous sample injections (depending on sample preparation, instrument maintenance, and the use of guard systems)
- No need for gradients for sample analysis due to the use of simple dilute acid — allowing use of universal detectors such as RI detectors
- Eliminates the need for high cost solvents (including waste disposal)
- Eluent serves as a self regenerating cleaning solution and does not degrade the column

Retention Chart

Another useful tool in choosing the best column for your sample is the use of retention charts of many common organic acids. If your compound does not appear in a retention chart, or the ability of a column to separate your compounds is in question, please contact Chrom Tech technical support.

RETENTION TABLE FOR ORGANIC ACID COLUMNS

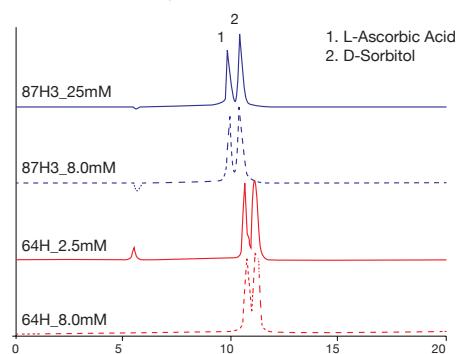
COMPOUND	COREGEL ION300	COREGEL ORH801	COREGEL 64H	COREGEL 107H	COREGEL 87H3
Malic	12.0	7.5	11.5	10.2	10.0
Malonic	11.1	7.4	10.8	9.8	9.8
cis-Aconitic	7.5	7.4	11.2	9.9	9.6
Adipic	21.8	13.7	21.9	17.5	16.5
Formic	17.1	11.1	16.5	15.0	14.6
Maleic	8.1	5.2	7.7	7.6	7.8
Ascorbic	7.8	5.0	7.5	7.4	10.5
Butyric	—	18.5	—	24.1	—
Glycolic	15.4	9.9	14.8	13.4	12.8
Glycoxilic	11.5	7.4	11.1	10.1	9.8
Citric	9.5	6.3	9.1	8.4	8.3
Tartaric	10.0	6.4	9.6	8.9	8.7
Nicotinic	—	—	—	—	26.4
Propionic	20.1	15.2	21.7	19.3	18.6
Succinic	9.2	9.8	8.8	12.7	8.7
Oxalic	6.6	4.5	6.5	6.7	6.9
Sorbic	18.7	12.0	17.9	16.0	15.3
Acrylic	23.3	—	22.5	19.9	19.4
Isobutyric	—	—	—	21.8	21.4
Lactic	16.0	10.3	15.5	13.6	13.1
Shikimic	15.5	9.7	14.7	12.5	12.1
Fumaric	16.4	10.3	15.7	14.0	13.1
Glutaric	18.2	11.3	17.2	14.7	14.0
Pyruvic	9.3	6.0	9.0	8.6	8.7
Acetic	—	12.4	18.4	16.6	—
Proponal	28.7	28.9	—	—	—
Quinic	12.6	7.9	12.1	10.7	10.4

Eluent Effect

By controlling the true strength of the acidic eluent, the retention times of the compounds can be influenced. The stronger (more acidic) the eluent, the longer the retention times in relation to the pKa. The eluent strength can be used by the analyst to enhance the separation of compounds.

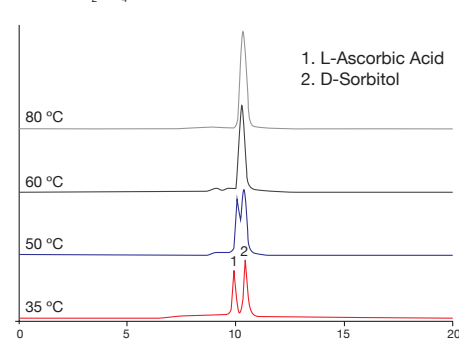
Separation of L-Ascorbic and D-Sorbitol species on Columns: 87H3 and 64H

0.6 mL/min at 80 °C, RI Detector



Separation of L-Ascorbic and D-Sorbitol on Coregel 87H3 at Different Temperatures

2.5 mM H₂SO₄ at 0.6 mL/min, RI Detector



TECH TIP | Temperature Effect

Temperature is by far the most powerful tool used to influence relative retention of compounds on Concise Separations ion-exclusion columns. By manipulating temperature, in combination with eluent strength and column types (polymer cross-linkage), an analyst can greatly enhance species separation.

CONCISE SEPARATIONS ORGANIC ACID ANALYSIS COLUMN COMPARISON CHART					
PHASE	CROSS-LINKAGE	IONIC FORM	PARTICLE SIZE (µm)	KEY SAMPLES	COMMENTS
COREGEL-87H1	8	H	10	Short bed length allows for fast analysis of simple acid samples	Ruggedness combined with fast analysis
COREGEL-87H3	8	H	9	Good resolution of many common organic acids	High durability
COREGEL ION-300	6	H	7	Separates organic acids, alcohols and carbohydrates all on the same column	Popular column. Select when high resolution is the primary concern
COREGEL-107H	10	H	8	Improved resolution for organic acids	New higher cross-linked column
COREGEL ORH-801	7	H	9	Versatile column for organic acids, alcohols and carbohydrates	Popular column. Provides good balance of high efficiency and ruggedness
COREGEL ORH-801FA	7	H	8	Fast analysis for fermentation monitoring, versatile column for organic acids, alcohols and carbohydrates	Popular column. Provides good balance of high efficiency and ruggedness
COREGEL WA-1 Wine Analysis	8	H	8	Rugged design allows for little sample prep High resolution makes the WA1 excellent for QA	Higher efficiency but as robust as the work horse 87H3 column
COREGEL ION-310	8	H	11	Designed for fast analysis of organic acids and alcohols	Ideal for the analysis of borate and bicarbonate
COREGEL ARH-601	6	H	8	Designed for the separation of aromatic organic acids	Uses aqueous mobile phases
COREGEL-64H	6	H	10	Versatile column for organic acids, alcohols and carbohydrates	Provides good balance of high efficiency and ruggedness
COREGEL USP L-17	8	H	8	Complies with USP L-17 specifications for the separation of citric, lactic, and acetic acid, can also separate a wide number of other organic acids	Hydrogen form ion-exclusion column

TECH TIP | Popular Grace/Alltech Columns

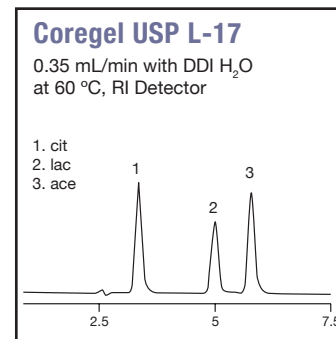
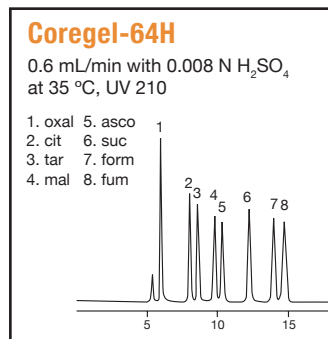
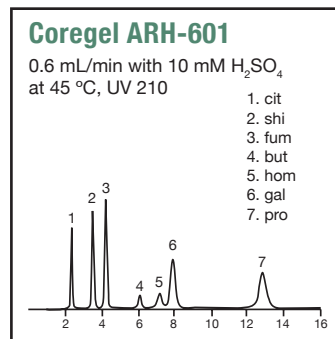
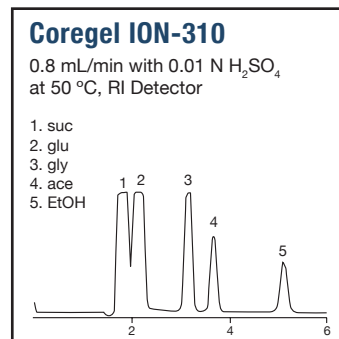
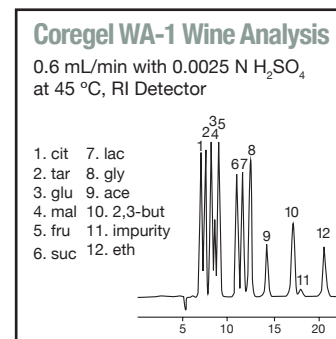
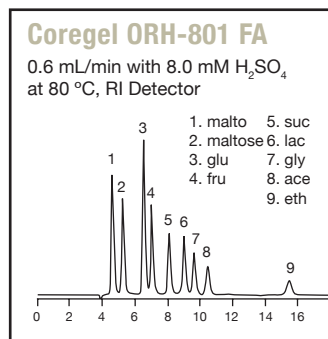
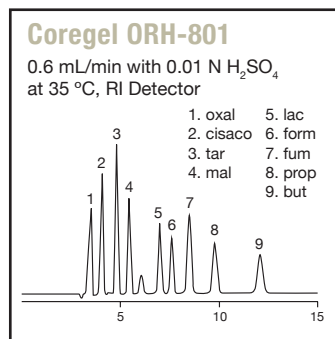
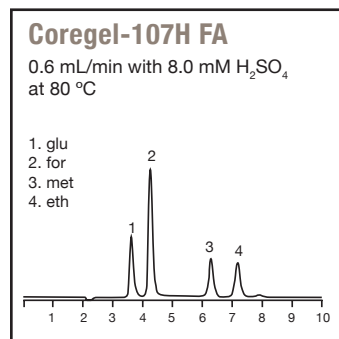
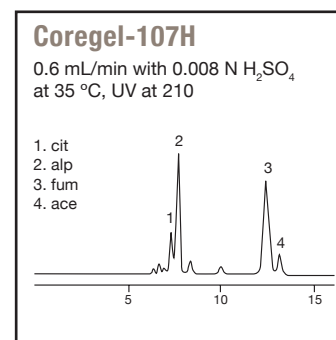
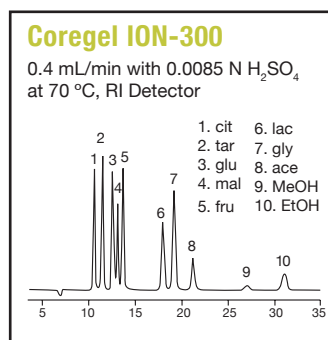
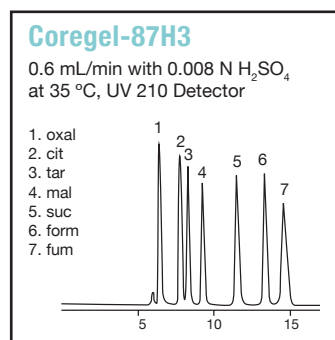
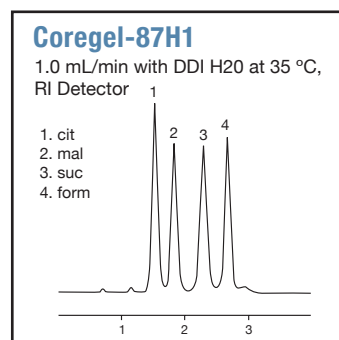
The IOA 2000 Column, (P/N: 9648) is the ION 310 column.
 The OA 2000 Column, (P/N: 9048) is the ARH 601 column.
 The IOA 1000 Columns, (P/N: 9046) is the ION 300 column.
 The OA 1000 Column, (P/N: 9046) is the ORH 801 column.

See ordering chart on page 100

Concise Separations Columns for Organic Acid Analysis (cont.)

DESCRIPTION	SIZE	COREGEL-87H1	COREGEL-87H3	COREGEL ION-300	COREGEL-107H	COREGEL ORH-801
Column	7.8 x 300 mm	—	ICE-99-9861	ICE-99-9850	ICE-99-9866	—
Column (Fast)	7.8 x 200 mm	—	—	—	—	ICE-99-9753
Column	7.8 x 150 mm	—	ICE-99-9865	—	—	—
Column	7.8 x 100 mm	ICE-99-5861	—	—	—	—
Column	6.5 x 300 mm	—	ICE-99-9871	—	—	ICE-99-9754
Column (Fast)	6.5 x 150 mm	—	—	—	ICE-99-9867	—
Guard Kit (1 holder, 2/pk cartridges)		ICE-99-2355	ICE-99-2361	ICE-99-2358	ICE-99-2356	ICE-99-2354
Guard Cartridges (2/pk)		—	ICE-99-2371	ICE-99-2368	ICE-99-2366	ICE-99-2364

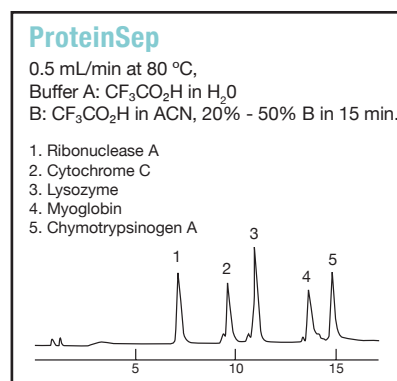
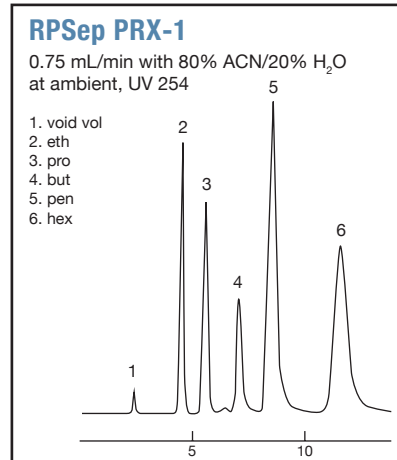
DESCRIPTION	SIZE	COREGEL WA-1 Wine	COREGEL ION-310	COREGEL ARH-601	COREGEL-64H	COREGEL USP L-17
Column	7.8 x 300 mm	ICE-99-9810	—	—	ICE-99-9860	—
Column (Fast)	6.5 x 100 mm	—	ICE-99-7752	ICE-99-5753	—	—
Column	4.1 x 250 mm	—	—	—	—	ICE-99-8461
Guard Kit (1 holder, 2/pk cartridges)		ICE-99-3510	ICE-99-2357	ICE-99-2353	ICE-99-2360	ICE-99-2352
Guard Cartridges (2/pk)		ICE-99-1310	ICE-99-2367	ICE-99-2363	ICE-99-2370	ICE-99-2362



Concise Separations Columns for RNA, Protein & Peptides

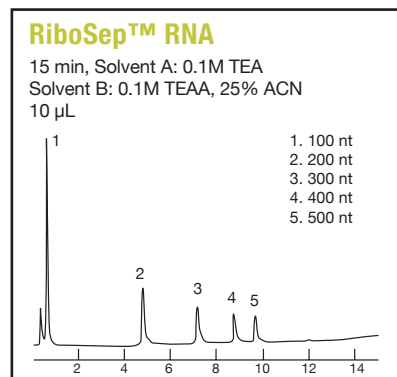
- ➔ Stable in the pH range of 0 to 14
- ➔ Completely stable under high temperature conditions which eliminate or reduce secondary tertiary effects of analytes
- ➔ Chemically stable which permits a variety of cleaning solutions for effective column cleaning
- ➔ Flow reversibility to facilitate the removal of contaminants on the inlet end of the column bed
- ➔ High efficiency, mono-dispersed beads
- ➔ Pure hydrophobic properties provided by proprietary and patented C18 functionality chemistry

Concise Separations ProteinSep columns offer unique characteristics to provide the protein chemist another valuable tool for the many varieties of samples in the proteomics field. The proprietary and highly rugged polymeric based columns will provide long lasting, reproducible results for a wide variety of samples. The Concise Separations protein analysis columns are packed with durable and high efficiency polymers that perform well even under the most extreme test conditions.



CONCISE SEPARATION COLUMNS FOR ANION ANALYSIS (STRONG ANION EXCHANGE COLUMNS)	
COLUMN	APPLICATION
RPSep PRX-1	Porous PS/DVB Polymer. Ideal for the separation of peptides and small molecules, pH stable from 0 – 14
ProteinSep	Non-porous PS-DVB Polymer with C18 Functional Group, monodispersed 2µm bead. High temperatures allowed, pH stable from 0 – 14
RiboSep™ RNA	Polymeric column, excellent for identification and purity assays for RNA fragments that are 100 to > 6,000 nt. Can be used with or without a column oven.

DESCRIPTION	SIZE	RPsep PRX-1	Protein Sep	RiboSep™ RNA
Column	7.8 x 50 mm	–	–	RPC-99-3810
Column	4.6 x 250 mm	RPC-99-8514	–	–
Column	4.6 x 150 mm	RPC-99-7514	–	–
Column	4.6 x 50 mm	–	PRO-99-4650	–
Guard Cartridges (2/pk)		RPC-99-1314	ANX-99-0010	–



Concise Separations Columns for Amino Acid Analysis

- ➔ Rugged polymeric substrate, stable in pH range of 0 to 14
- ➔ High efficiency and resolution
- ➔ Reproducibility lot-to-lot and column-to-column
- ➔ Available for both physiological samples (Li⁺ format) and protein hydrolysate samples (Na⁺ form)
- ➔ Post column derivitization detection

Ion-exchange chromatography is a popular technique for the analysis of amino acids because both retention times and quantification are highly reproducible regardless of the sample matrix. This unique matrix insensitivity is important when comparing results from different patients or batches of protein hydrolysate.

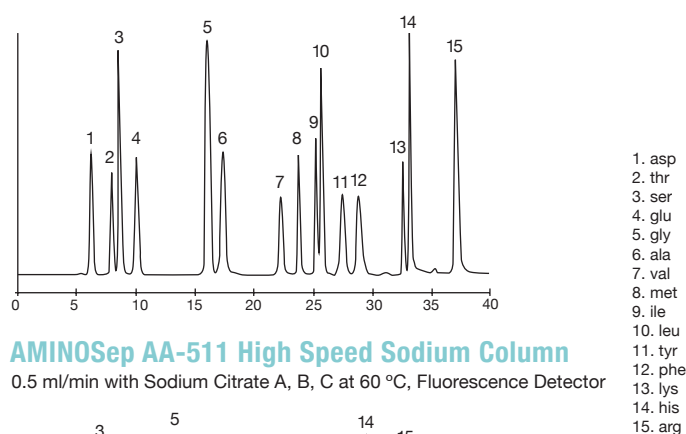
Amino acids are zwitterions; at low pH, they are positively-charged and are bound to the resin by their attraction to the negatively-charged ion-exchange sites. Almost all the contaminants, i.e. matrix, are eluted at the void. The amino acids are then selectively eluted by increasing the pH and salt concentration with different buffers. With few exceptions, the order of elution follows the isoelectric point of the amino acids, i.e. acidic amino acids first, then neutral and basic. Because the separation and the ensuing post-column reaction of amino acids are devoid of contaminants, amino acid analyses via ion-exchange chromatography are highly reproducible.

CONCISE SEPARATIONS AMINO ACID ANALYSIS COLUMN COMPARISON CHART					
PHASE	CROSS-LINKAGE	IONIC FORM	PARTICLE SIZE (µm)	KEY SAMPLES	COMMENTS
AMINOSep AA-911	8	Sodium	9	Designed for complicated samples from protein hydrolysates. Increased polymer bed yields better resolving power	Popular column—Higher capacity than the Beckman columns
AMINOSep AA-511	10	Sodium	5	Designed for faster analysis than the AA-911 but still gives high resolution	Most popular AA column
Lithium Amino Acid (6300 & 7300 systems)	10	Lithium	6	Designed for use with the Beckman Coulter® 6300 and 7300 Amino Acid Analyzers using either the Beckman or Pickering Lithium buffer systems	Ideal for Physiological amino acid analysis
Sodium Amino Acid (6300 & 7300 systems)	10	Sodium	5	Designed for use with the Beckman Coulter® 6300 and 7300 Amino Acid Analyzers using either the Beckman Coulter or Pickering Sodium buffer systems	Ideally suited for routine hydrolysate analysis, Extremely rugged polymer
Sodium Amino Acid (for System Gold)	10	Sodium	5	Designed for use with the Beckman Coulter® System Gold Amino Acid Analyzer	Ideal for the separation of hydrolysate amino acids.

DESCRIPTION	SIZE	AMINOSep AA-911	AMINOSep AA-511	LITHIUM AMINO ACID (6300/7300)	SODIUM AMINO ACID (6300/7300)	SODIUM AMINO ACID (System Gold)
Column	4.6 x 250 mm	AAA-99-8553	—	—	—	—
Column (Waters)	4.6 x 250 mm	AAA-99-8553W	—	—	—	—
Column	4.6 x 150 mm	—	AAA-99-7554	—	—	—
Column	4.6 x 120 mm	—	AAA-99-6554	—	—	—
Column	4.0 x 200 mm	—	—	—	—	AAA-99-6310
Column	4.0 x 120 mm	—	—	—	AAA-99-6312	—
Column	4.0 x 100 mm	—	—	AAA-99-6311	—	—
Guard Kit (1 holder, 2/pk cartridges)		AAA-99-2353	AAA-99-2354	AAA-99-2311	AAA-99-2312	AAA-99-2312
Guard Cartridges (2/pk)		AAA-99-1353	AAA-99-1354	AAA-99-1311	AAA-99-1312	AAA-99-1312

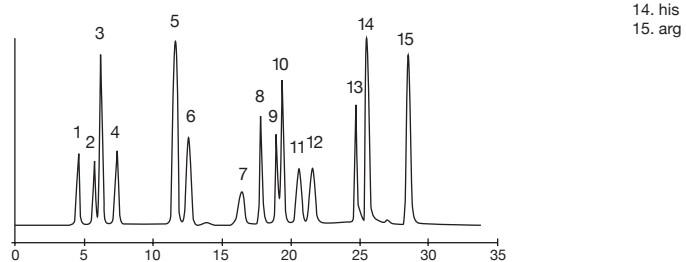
AMINOSep AA-511 Sodium Column

0.5 ml/min with Sodium Citrate A, B, C at 82 °C, Fluorescence Detector



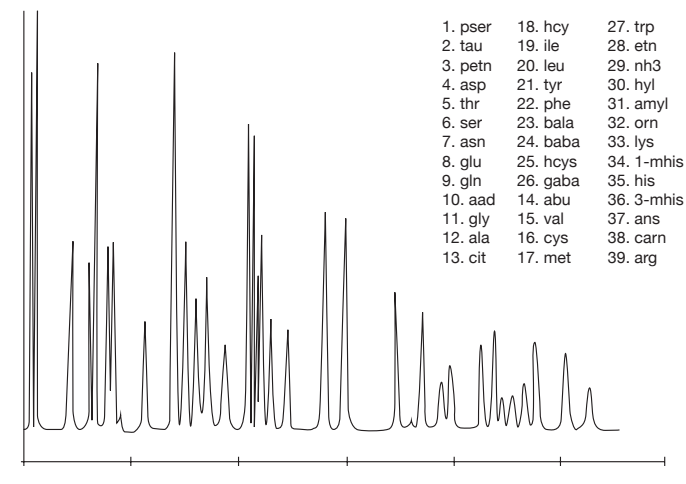
AMINOSep AA-511 High Speed Sodium Column

0.5 ml/min with Sodium Citrate A, B, C at 60 °C, Fluorescence Detector



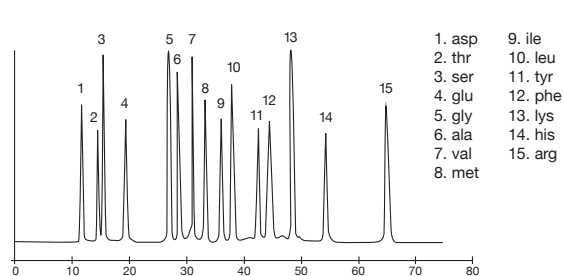
Lithium Amino Acid Column

20 mL/hr with LiA, LiB, LiC at 33-60-77°C, Fluorescence Detector



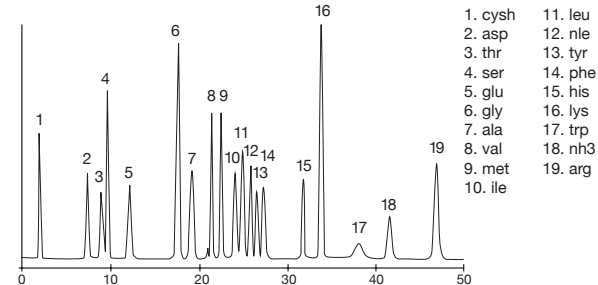
AMINOSep AA-911 Sodium Column

0.5 ml/min with Sodium Citrate A, B, C at 82 °C, Fluorescence Detector



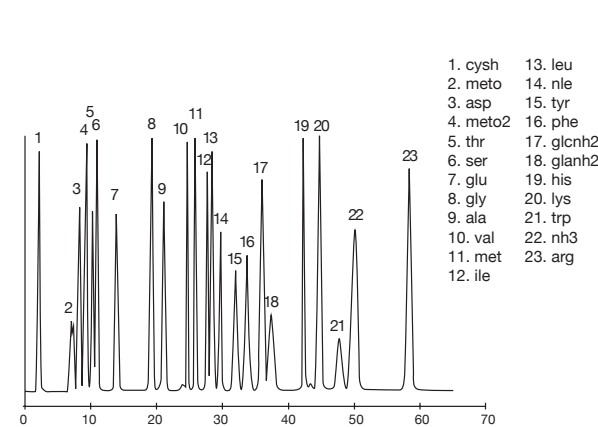
Sodium Amino Acid Column (System Gold)

26 ml/hr with NaE, NaF, NaD at 50-65-77°C, Fluorescence Detector



Sodium Amino Acid Column (6300/7300 systems)

26 ml/hr with NaE, NaF, NaD at 50-65-77°C, Fluorescence Detector



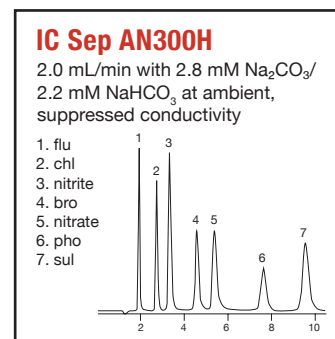
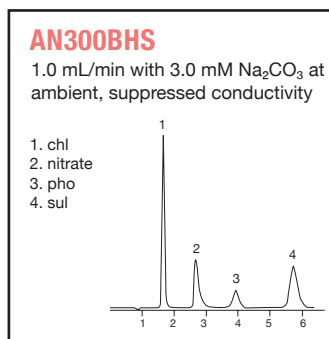
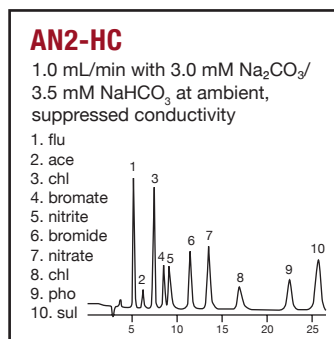
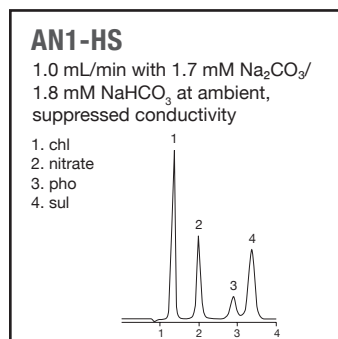
Concise Separations ICSep Column for Ion Analysis

- ➔ Rugged polymeric substrate, stable in pH range of 0 to 14
- ➔ Solvent compatibility
- ➔ High efficiency
- ➔ Reproducibility
- ➔ Anion analysis with strong anion exchange columns

Concise Separations Ion Chromatography (IC) columns have been designed to run on a variety of systems. They are tested to be compatible with Ion Chromatographs from: Metrohm, Dionex, Hach-Lachat, and Alltech. The selectivities have been optimized to be compatible with many of the common IC columns currently available. This includes columns that meet the requirements of E.P.A. methods 300 parts a and b, and E.P.A. method 300.1 .

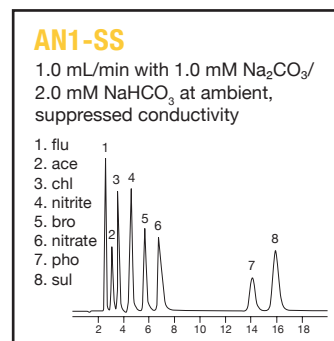
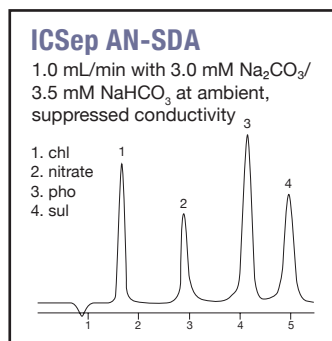
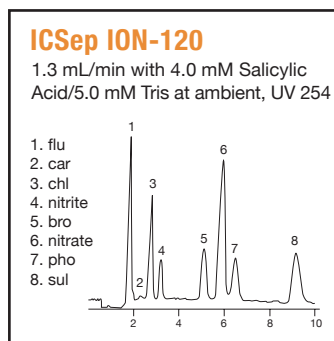
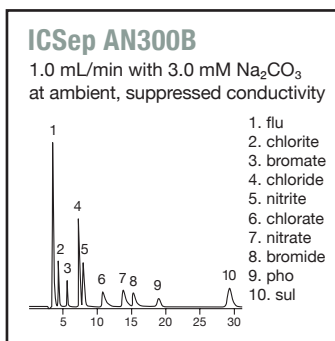
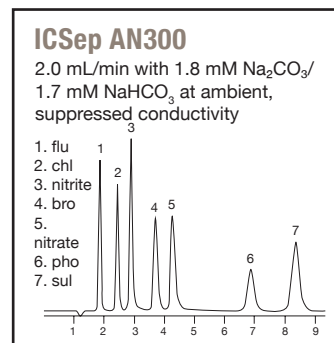
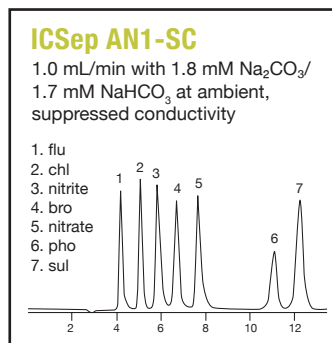
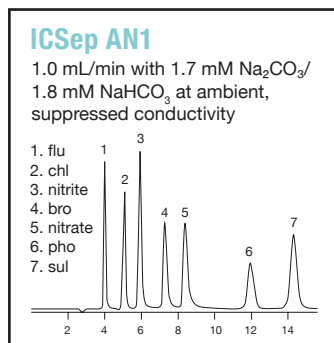
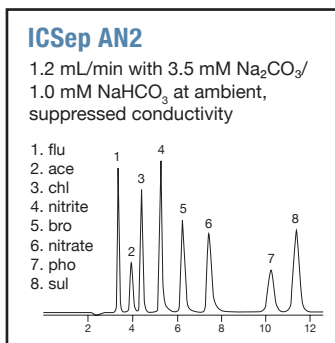
CONCISE SEPARATION COLUMNS FOR ANION ANALYSIS (STRONG ANION EXCHANGE COLUMNS)

COLUMN	COMPETITIVE COLUMNS	APPLICATION	RECOMMENDED ELUENTS	COMMENTS
ICSep AN300	Dionex AS4A	F-, Cl-, NO ₂ -, Br-, NO ₃ -, HPO ₄ ²⁻ , SO ₄ ²⁻ , By E.P.A. Method 300.0(a)	Carbonate	Good for drinking water method, EPA 300.0 a or 300.1. Superb fluoride separation from water dip and other anions. Fast analysis times (under 9 min for 7 std anions)
ICSep AN1	Dionex AS9-HC	F-, Cl-, NO ₂ -, Br-, NO ₃ -, HPO ₄ ²⁻ , SO ₄ ²⁻ , Low molecular weight, Organic acids in medium to high ionic strength matrices, Cr(III), Cr(VI) as CrO ₃ -, CrO ₄ ²⁻	Carbonate	Can be used with non-suppressed conductivity detection. Very good fluoride separation from water dip, great for toothpaste analysis. Great for trace anion work.
ICSep AN1SC	Dionex AS9-HC	F-, Cl-, NO ₂ -, Br-, NO ₃ -, HPO ₄ ²⁻ , SO ₄ ²⁻ , Low molecular weight, Organic acids in medium to high ionic strength matrices	Solvent compatible	Similar selectivity as the AN1 column but is solvent compatible for easy cleanup
ICSep AN2	Dionex AS14	Arsenate, Sulfite, Selenate, Arsenite, Selenite, F-, Cl-, NO ₂ -, Br-, NO ₃ -, HPO ₄ ²⁻ , SO ₄ ²⁻ , Low molecular weight Organic acids	Sodium hydroxide eluents	Superb fluoride, acetate & chloride resolution
ICSep AN300B	Dionex AS9	F-, Cl-, NO ₂ -, Br-, NO ₃ -, HPO ₄ ²⁻ , SO ₄ ²⁻ , ClO ₂ -, ClO ₃ -, BrO ₃ -	Solvent compatible	Good for drinking water method, EPA 300.0 b for oxyhalides. High capacity and unique selectivity
ICSep ION-120		F-, Cl-, NO ₂ -, Br-, NO ₃ -, HPO ₄ ²⁻ , SO ₄ ²⁻ , Low molecular weight, Organic acids in medium to high ionic strength matrices, Cr(III), Cr(VI) as CrO ₃ -, CrO ₄ ²⁻	Salicylic Acid	Very good for non-suppressed detection Fast analysis times. No conductivity cell needed (UV)
ICSep AN-SDA		F-, Cl-, NO ₂ -, Br-, NO ₃ -, HPO ₄ ²⁻ , SO ₄ ²⁻ , Low molecular weight, Organic acids in medium to high ionic strength matrices, Cr(III), Cr(VI) as CrO ₃ -, CrO ₄ ²⁻	Solvent compatible	Created for phosphate & other anions in soft drinks, no need to dilute or pre-treat soft drink. Unlike other anion columns, colorings and additives will not foul column.
AN1-SS	Alltech A-2	F-, Cl-, NO ₂ -, Br-, NO ₃ -, HPO ₄ ²⁻ , SO ₄ ²⁻ , By E.P.A. Method 300.0(a)	Solvent compatible	Designed to replace Alltech A-2 anion column
AN1-HS		F, Cl, NO ₂ , Br, PO ₄ , SO ₄	Carbonate	Fast AN1 column with sulfate detection under four minutes
AN2-HC		All inorganic anions including oxyhalides and low mw organic acids	Solvent compatible	Ideal for tough separations as extra capacity gives improved resolution capabilities. Superb fluoride, acetate & chloride resolution
AN300BHS		For simple samples containing oxyhalides	Solvent compatible	Fast AN300B column with sulfate under six minutes. Can resolve oxyhalides. Good for fast analysis times & high throughput
ICSep AN300H		F-, Cl-, NO ₂ -, Br-, NO ₃ -, HPO ₄ ²⁻ , SO ₄ ²⁻ , By E.P.A. Method 300.0(a)	Carbonate	Very high capacity AN300 column. Ideal for tough anion separations as extra capacity gives improved resolution capabilities. Superb anion resolution even with quick retention times. Good for drinking water method, EPA 300.0 a or 300.1 . Designed for trace anion analysis along with large amounts of Cl or NO ₃ .



DESCRIPTION	SIZE	AN2	AN1	AN1-SC	AN300	AN300B	ION-120
PEEK Column	5.5 x 150 mm	—	—	—	ANX-99-7620	—	—
PEEK Column	4.6 x 250 mm	ANX-99-8515	ANX-99-8511	ANX-99-8514	—	ANX-99-8516	—
PEEK Column	4.6 x 150 mm	—	—	—	—	—	ANX-99-6650
PEEK Column (Fast)	4.6 x 100 mm	—	ANX-99-5511	—	—	—	—
SS Column	4.6 x 120 mm	—	—	—	—	—	ANX-99-6550
Guard Cartridges (3/pk)		ANX-99-0015	ANX-99-0010	ANX-99-0014	ANX-99-0010	ANX-99-0016	ANX-99-0090
Guard Cartridge Holder		ANX-99-0050	ANX-99-0050	ANX-99-0050	ANX-99-0050	ANX-99-0050	AXC-99-1300
Guard Column		ANX-99-3515	ANX-99-3510	ANX-99-3514	ANX-99-3510	ANX-99-3516	—
Replacement Frits (5/pk)		AXC-99-0012	AXC-99-0012	AXC-99-0012	AXC-99-0012	AXC-99-0012	—
Guard Disc® (5/pk)		GRD-99-0703	GRD-99-0703	GRD-99-0703	GRD-99-0703	GRD-99-0703	—
Cartridge Kit (Column, Guard Cartridges (3/pk), Column Coupler & Guard Cartridge Holder)		ANX-99-8545K	ANX-99-8541K	ANX-99-8544K	ANX-99-7643	ANX-99-8546K	—
Column Kit (Column, Guard Column & Column Coupler)		ANX-99-8535K	ANX-99-8531K	ANX-99-8534K	ANX-99-7633	ANX-99-8536K	—
Guard Kit (Universal Holder, Guard Cartridges (3/pk))		—	—	—	—	—	ANX-99-2350

DESCRIPTION	SIZE	AN-SDA	AN1-SS	AN1-HS	AN2-HC	AN300BHS	AN300H
PEEK Column	4.6 x 200 mm	—	—	—	ANX-99-8518	—	—
PEEK Column	4.6 x 150 mm	—	—	—	—	—	ANX-99-4650
PEEK Column	4.6 x 50 mm	ANX-99-4650	—	ANX-99-3518	—	ANX-99-3566	—
SS Column	4.6 x 100 mm	—	ANX-99-5518S	—	—	—	—
Guard Cartridges (3/pk)		—	—	—	ANX-99-0018	—	ANX-99-0010
Guard Cartridge Holder		—	—	—	ANX-99-0050	—	ANX-99-0050
Guard Column		—	—	—	ANX-99-3517	—	ANX-99-3510
Replacement Frits (5/pk)		—	—	AXC-99-0012	AXC-99-0012	AXC-99-0012	AXC-99-0012
Guard Disc® (5/pk)		—	—	GRD-99-0703	GRD-99-0703	GRD-99-0703	GRD-99-0703
Cartridge Kit (Column, Guard Cartridges (3/pk), Column Coupler & Guard Cartridge Holder)		—	—	—	ANX-99-8548K	—	—
Column Kit (Column, Guard Column & Column Coupler)		—	—	—	ANX-99-8538K	—	—



Hamilton Reversed-Phase HPLC Columns | Specification Chart

HAMILTON REVERSED PHASE COLUMNS						
PACKING NAME	SUPPORT MATERIAL	PORE SIZE	TEMP. LIMITS	MOBILE PHASE LIMITS	BUFFER STRENGTH	MAXIMUM PRESSURE
HxSil C18	Silica, end capped	110 Å	5-60 °C	pH 1.5 – 10. 0-100% aqueous, organic modifier	N/A	6,000 PSI
HxSil C8	Silica, end capped	110 Å	5-60 °C	pH 1.5 – 10. 0-100% aqueous, organic modifier	N/A	6,000 PSI
PRP-C18	C18 bonded to PSDVB*	100 Å	5-85 °C	pH 1 – 13. 0-100% aqueous, organic modifier	0.0-0.5 N	5,000 PSI
PRP-1	PSDVB*	100 Å	5-85 °C	pH 1-13. 0-100% aqueous, organic modifier	0.0-0.5 N	5,000 PSI
PRP-3	PSDVB*	300 Å	5-85 °C	pH 1-13. 0-100% aqueous, organic modifier	0.0-0.5 N	5,000 PSI
PRP-h5	Fluorinated PSDVB*	300 Å	5-85 °C	pH 1 – 13. 0-100% aqueous, organic modifier	0.0-0.5 N	5,000 PSI

*PSDVB is Poly(styrene-divinylbenzene)

Hamilton HxSil C18 & HxSil C8 | Silica Packing

Hamilton HxSil C18 columns are well end-capped for retention time reproducibility and durability. HxSil C18 columns exhibit greater retention than most columns and enhance the separation of compounds that are not sufficiently retained on other C18 columns.

Hamilton HxSil C8 columns are well end-capped for retention time reproducibility and durability. The C8 demonstrates excellent selectivity needed for complex sample mixtures and gives shorter retention times than a C18.



SIZE (mm)	HxSil C18		HxSil C8			
	3 µm	5 µm	3 µm	5 µm		
4.6 x 250 SS	—	79869	—	—		
4.6 x 150 SS	—	79868	—	—		
4.6 x 100 SS	—	—	—	79101		
2.1 x 100 SS	—	—	—	79109		
2.1 x 50 SS	79889	—	79117	79107		
2.1 x 33 SS	—	—	79116	—		
Analytical Guard Column	79299		79298			
Analytical Guard Cartridge Holder SS	32908		32908			
Analytical Repl Cartridges SS (5/pk)	79452		79451			
Analytical Starter Kit ¹ SS	79459		79458			
Prep/Semiprep Guard Column	79923		79922			
Prep/Semiprep Guard Cartridge Holder SS	5095-01		5095-01			
Prep/Semiprep Repl Cartridges SS (2/pk)	79138		79136			
Prep/Semiprep Starter Kit ² SS	79137		79135			
DESCRIPTION	3 µm	5 µm	10 µm	3 µm	5 µm	10 µm
Bulk Resin (1 gram)	79139	79140	79141	79142	79143	79144

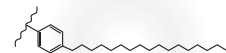
1) Analytical Starter Kit includes 1 holder, 2 cartridges

2) Prep/Semiprep Starter Kit includes 1 holder, 1 cartridge

 Call Chrom Tech to custom build your Hamilton HPLC column

Hamilton PRP-C18 Columns | Polymer Packing

- ➔ Superior resolution for purer oligos
- ➔ Extended column lifetime for increased productivity
- ➔ High loading capacity for time and cost savings
- ➔ High efficiency separations at any pH



PRP-C18

SIZE (mm)	5 µm	12 – 20 µm	
21.2 x 50 SS	—	79678	
4.6 x 250 SS	79677	—	
4.6 x 250 PEEK	79684	—	
4.6 x 150 SS	79676	—	
4.6 x 150 PEEK	79683	—	
4.6 x 50 SS	79675	—	
4.6 x 50 PEEK	79682	—	
2.1 x 250 SS	79674	—	
2.1 x 250 PEEK	79681	—	
2.1 x 150 SS	79673	—	
2.1 x 150 PEEK	79680	—	
2.1 x 50 SS	79672	—	
2.1 x 50 PEEK	79679	—	
Analytical Guard Column		79291	
Analytical Guard Cartridge Holder SS		32908	
Analytical Guard Cartridge Holder PEEK		79477	
Analytical Repl Cartridges SS (5/pk)		79686	
Analytical Repl Cartridges PEEK (5/pk)		79688	
Analytical Starter Kit ¹ SS		79685	
Analytical Starter Kit ¹ PEEK		79687	
Prep/Semiprep Guard Column		79918	
Prep/Semiprep Guard Cartridge Holder SS		5095-01	
Prep/Semiprep Repl Cartridges SS (2/pk)		79690	
Prep/Semiprep Starter Kit ² SS		79689	
DESCRIPTION	5 µm	10 µm	12 – 20 µm
Bulk Resin (1 gram)	79791	79792	79793

1) Analytical Starter Kit includes 1 holder, 2 cartridges 2) Semiprep/Prep Starter Kit includes 1 holder, 1 cartridge

SPECIFICATIONS

ANALYTE EXAMPLES

Peptides, DNA, RNA, Oligonucleotides, Nucleotides, Vitamins, Steroids, Herbicides, Pharmaceutical compounds

APPLICATIONS

Organic compounds: small molecules (< 2,000 mw), pharmaceuticals, steroids, halides, vitamins, amino acid analysis, herbicides

Rapid Separation of Basic Drug Compounds on PRP-C18

Column: PRP-C18
4.1 x 50 mm, 5 µm
79675

Instrument: Agilent 1100 quaternary pump with UV detector

Mobile Phase: A: 30 mM Diethylamine
B: Mobile phase A + 95% ACN, 5% H₂O

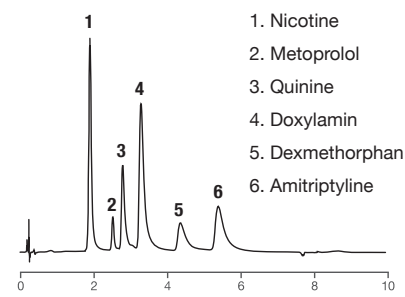
Flow Rate: 2 mL/min

Gradient: 10 to 100% B in 5 minutes

Temperature: Ambient

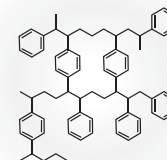
Injection Vol: 10 µL

Detection: UV at 265 nm



Hamilton PRP-1 Columns | Polymer Packing

Sample recovery is vital to sample purification. Problems arise when labile samples become irreversibly bound to the silanol groups present on C8 and C18 HPLC columns. Since Hamilton polymers are made entirely of poly styrene-divinylbenzene, there are no silanol groups to cause sample loss. Recovery and quantitation of labile and reactive samples is enhanced. The purification of protected oligonucleotides demonstrates the enhanced recovery of polymer supports. While approximately 50–80% of an oligonucleotide is recovered on a C18 column, the equivalent PRP-1 column recovers 95% or greater of the same sample. Unlike silica-based C8 or C18 columns, PRP-1 has no stationary phase coating. Since there is no stationary phase to hydrolyze, the column maintains its performance characteristics longer than many C8 or C18 columns.



PRP-1

SIZE (mm)	5 µm	7 µm	10 µm	12 – 20 µm			
101.6 x 250 SS	—	—	—	79252			
50.0 x 250 SS	—	—	79567	79493			
30.0 x 250 SS	—	—	—	79229			
21.2 x 250 SS	—	79352	79478	79428			
21.2 x 75 SS	79154	—	—	—			
10.0 x 250 SS	—	79531	79496	—			
10.0 x 100 SS	79355	—	79499	—			
10.0 x 50 SS	—	79367	—	—			
7.0 x 305 SS	79795	—	79426	—			
7.0 x 100 SS	—	—	79495	—			
4.6 x 250 SS	79571	79380	79381	—			
4.6 x 150 SS	79423	—	79351	—			
4.6 x 100 SS	79558	—	—	—			
4.1 x 250 SS	79820	79422	79427	—			
4.1 x 150 SS	79444	79529	79425	—			
4.1 x 100 SS	79479	—	—	—			
4.1 x 50 SS	79443	—	—	—			
2.1 x 150 SS	79366	—	—	—			
2.1 x 100 SS	79790	—	—	—			
1.0 x 150 SS	79753	—	—	—			
1.0 x 50 SS	—	79755	—	—			
Analytical Guard Column			79286				
Analytical Guard Cartridge Holder SS			32908				
Analytical Guard Cartridge Holder PEEK			79477				
Analytical Repl Cartridges SS (5/pk)			79445				
Analytical Repl Cartridges PEEK (5/pk)			79318				
Analytical Starter Kit ¹ SS			79447				
Analytical Starter Kit ¹ PEEK			79317				
Prep/Semiprep Guard Column			79912				
Prep/Semiprep Guard Cartridge Holder SS			5095-01				
Prep/Semiprep Repl Cartridges SS (2/pk)			79122				
Prep/Semiprep Starter Kit ² SS			79121				
DESCRIPTION	5 µm	7 µm	10 µm	12 – 20 µm	20 – 30 µm	30 – 50 µm	50 – 75 µm
Bulk Resin (1 gram)	79578	79579	79580	79581	79750	79582	79583

SPECIFICATIONS

ANALYTE EXAMPLES

Polycyclic aromatic hydrocarbons (PAH), ionizable organic compounds, steroids, peptide fragments

APPLICATIONS

Organic compounds: small molecule (< 2,000 mw), pharmaceuticals, steroids, nucleic acids, vitamins, herbicides

1) Analytical Starter Kit includes 1 holder, 2 cartridges

2) Prep/Semiprep Starter Kit includes 1 holder, 1 cartridge

 Call Chrom Tech to custom build your Hamilton HPLC column

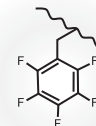
Hamilton PRP-3 & PRP-h5 Columns | Polymer Packing

Hamilton's PRP-3 is a polymeric reversed-phase HPLC column designed for the purification and isolation of proteins and peptides with very good recovery (> 90%). It is based off of the PRP-1 but utilizes a 300 Å pore size rather than the PRP-1's 100 Å pore size. The highly inert polymeric packing poly(styrene-divinylbenzene) enhances protein recovery because there are no silanol groups on the support to cause irreversible protein adsorption.

The PRP-h5 utilizes the PRP-3 as its base with a pentafluorinated modification, making it more hydrophobic in nature and delivers a selectivity difference from standard silica C18 stationary phases. This difference is especially pronounced for halogenated solutes.



PRP-3



PRP-h5

SIZE (mm)	PRP-3		PRP-h5	
	10 µm	12 – 20 µm	5 µm	12 – 20 µm
21.2 x 250 SS	—	79469	—	—
21.2 x 100 SS	—	79186	—	—
10.0 x 250 SS	79526	—	—	—
10.0 x 150 SS	—	—	79274	—
10.0 x 100 SS	—	—	79263	—
7.0 x 305 SS	79468	—	—	—
4.6 x 250 SS	79574	—	79273	—
4.6 x 150 SS	79382	—	79272	—
4.6 x 100 SS	—	—	79262	—
4.6 x 50 SS	—	—	79261	—
4.1 x 250 SS	79794	—	—	—
4.1 x 150 SS	79466	—	—	—
2.1 x 150 SS	79392	—	79271	—
2.1 x 100 SS	—	—	79270	—
Analytical Guard Column	79295		79296	
Analytical Guard Cartridge Holder SS	32908		32908	
Analytical Guard Cartridge Holder PEEK	79477		—	
Analytical Repl Cartridges SS (5/pk)	79454		79268	
Analytical Repl Cartridges PEEK (5/pk)	79395		—	
Analytical Starter Kit ¹ SS	79461		79267	
Analytical Starter Kit ¹ PEEK	79393		—	
Prep/Semiprep Guard Column	79920		79921	
Prep/Semiprep Guard Cartridge Holder SS	5095-01		5095-01	
Prep/Semiprep Repl Cartridges SS (2/pk)	79124		79278	
Prep/Semiprep Starter Kit ² SS	79123		79277	
DESCRIPTION	10 µm	12 – 20 µm	5 µm	12 – 20 µm
Bulk Resin (1 gram)	79701	79702	79269	79280

1) Analytical Starter Kit includes 1 holder, 2 cartridges 2) Prep/Semiprep Starter Kit includes 1 holder, 1 cartridge

SPECIFICATIONS

ANALYTE EXAMPLES

PRP-3: Globular proteins, Albumins, Antibody fragments, Tryptic digests, DNA, RNA oligomers, Synthetic high mw polymers

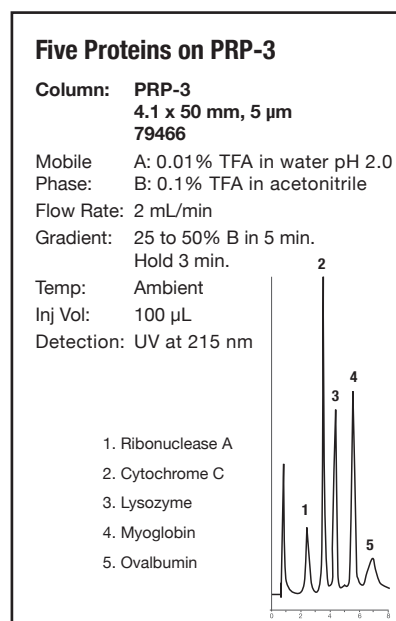
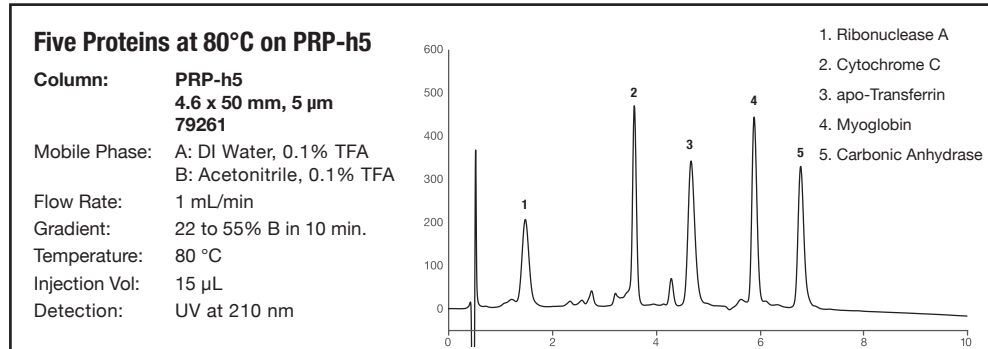
PRP-h5: Oligonucleotides, Angiotensin, apo-Transferrin, Apomyoglobin (equine), Carbonic anhydrase, Cytochrome C, Myoglobin, Ribonuclease A

APPLICATIONS

PRP-3: Organic compounds: large molecules (> 2,000 mw), peptides, proteins, protein digests, protected and de-protected oligonucleotides, nucleic acids

PRP-h5: Organic compounds: macromolecules (> 2,000 mw), pharmaceuticals, protein digests, tryptic digests, proteomics

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Hamilton Ion Exchange HPLC Columns | Specification Chart

HAMILTON ANION EXCHANGE COLUMNS							
PACKING NAME	SUPPORT MATERIAL	EXCHANGE CAPACITY	PORE SIZE	TEMP. LIMITS	MOBILE PHASE LIMITS	BUFFER STRENGTH	MAXIMUM PRESSURE
ANION EXCHANGE COLUMNS							
PRP-X100	PSDVB* with Tri-methyl ammonium Exchanger	0.19meq/gm	100 Å	pH Dependent**	pH 1-13. 0-100% aqueous, organic modifier	0.0-0.5N	5,000 PSI
PRP-X110	PSDVB* with Tri-methyl ammonium Exchanger	0.11meq/gm	100 Å	pH Dependent**	pH 1-13. 0-100% aqueous, organic modifier	0.0-0.5N	5,000 PSI
PRP-X500	Poly(meth-acryl amido-propyl Trimethyl-ammonium chloride)	1.6meq/gm	Superficially porous	pH Dependent**	pH 1-13. 0-100% aqueous, organic modifier	0.0-2.0N	5,000 PSI
PRP-X600	Poly (di-methyl amido-propyl meth-acrylamide)	1.6meq/gm	Superficially porous	pH Dependent**	pH 1-13. 0-100% aqueous, organic modifier	0.0-1.0N	5,000 PSI
RCX-10	PSDVB* with Tri-methyl ammonium Exchanger	0.35meq/gm	100 Å	pH Dependent**	pH 1-13. 0-100% aqueous, organic modifier	0.0-1.0N	5,000 PSI
RCX-30	PSDVB* with Tri-methyl ammonium Exchanger	1.0meq/gm	100 Å	pH Dependent**	pH 1-13. 0-100% aqueous, organic modifier	0.0-1.0N	5,000 PSI
CATION EXCHANGE COLUMNS							
PRP-X200	PSDVB* Sulfonate Exchanger	35ueq/gm	100 Å	5-60 °C	pH 1-13. 0-100% aqueous, organic modifier	0.0-0.5N	5,000 PSI
PRP-X400	PSDVB* Sulfonate Exchanger	2.5meq/gm	N/A	5-60 °C	pH 1-13. 0-100% aqueous, organic modifier	0.0-5.0N	5,000 PSI
PRP-X800	PSDVB* Itaconate Exchanger	1.6meq/gm	100 Å	5-60 °C	pH 1-13. 0-100% aqueous, organic modifier	0.0-0.5N	5,000 PSI
HC-40 Calcium	PSDVB* Sulfonate Exchanger	5meq/gm	Gel-type	25-90 °C	100% Water	Water	1,000 PSI
HC-75 Calcium	PSDVB* Sulfonate Exchanger	5meq/gm	Gel-type	25-90 °C	100% Water 0-40% Acetonitrile	Water	400 PSI
HC-75 Hydrogen	PSDVB* Sulfonate Exchanger	5meq/gm	Gel-type	25-90 °C	100% Water 0-40% Acetonitrile	Water	400 PSI
HC-75 Lead	PSDVB* Sulfonate Exchanger	5meq/gm	Gel-type	25-90 °C	100% Water 0-40% Acetonitrile	Water	400 PSI

*PSDVB is Poly(styrene-divinylbenzene)

**pH 1-7.9 Temp. 5-60 °C; pH 8-13 Temp. 5-30 °C

Arsenic Speciation on Hamilton PRP-X100

Organic arsenic compounds added to feed stocks of chicken and poultry pose serious environmental and ecological threats. National and worldwide health organizations, such as the United States Environmental Protective Agency and the US Food and Drug Administration, have recently implemented more stringent concentration limits for arsenic species in drinking water and foodstuffs.

Analysis of arsenic species is made challenging due to diverse sample matrices. To circumvent these problems, an HPLC-ICPMS method has been developed. Resolution of arsenic compounds is achieved by ion exchange chromatography on a Hamilton PRP-X100 column, a 55% cross-linked polystyrene-divinylbenzene copolymer functionalized with quaternary ammonium anion-exchanger group. Detection is accomplished by inductively coupled plasma-mass spectrometry.

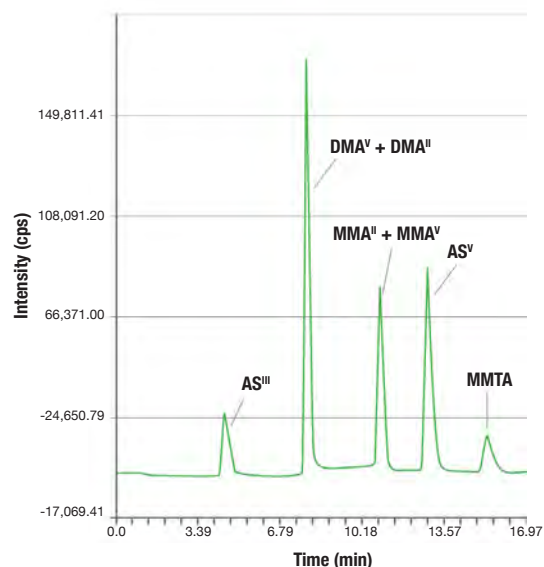
Column: PRP-X100
4.6 x 250 mm, 5 µm
79181

Mobile Phase: 2 mM (NH₄)₂CO₃ for 0 – 3 min
40 mM (NH₄)₂CO₃ for 3 – 14 min
2 mM (NH₄)₂CO₃ for 13 – 17 min

Flow Rate: 1.0 mL/min

Injection Vol: 50 µL, 100 µg/L of each standard

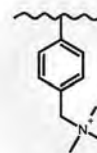
Detection: ICP-MS



Borrowed (with permission) from P. Alava et al. Biomed. Chromatogr. 2012; 26: 524-533

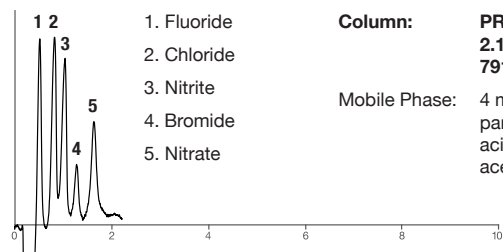
Hamilton PRP-X100 and PRP-X110 Columns | Anion

Hamilton PRP-X100 and PRP-X110 are highly stable, inert materials. The PRP-X100 can be used with virtually any HPLC or ion chromatograph, including dedicated IC units. Technological advancements in modern polymer chemistry now deliver a more rugged column with exceptionally higher separation efficiencies than earlier predecessors. PRP-X100 and PRP-X110 columns are well suited for use in systems employing suppressed/non-suppressed conductivity, electrochemical, UV, and ICP-MS detection. Chromatographers currently using wet chemical or colorimetric methods will find ion chromatography greatly reduces sample pretreatment and improves the accuracy and precision of results.



PRP-X100/X110

Fast Separation of Common Anions on PRP-X100



1. Fluoride
2. Chloride
3. Nitrite
4. Bromide
5. Nitrate

Column: PRP-X100
2.1 x 50 mm, 5 µm
79150

Mobile Phase: 4 mM
parahydroxybenzoic acid, pH 8.5 /4%
acetonitrile

Flow Rate: 0.8 mL/min

Gradient: Isocratic

Temperature: 80°C

Injection Vol: 1 µL

Sample Concentration: 0.2 mg/mL

Detection: UV at 305 nm

SPECIFICATIONS

ANALYTE EXAMPLES

Halides, Polarizable anions, Organic acids, Organic and inorganic arsenic species

INDUSTRIES

Pharmaceutical, Environmental, Medical Research, Food and Beverage

APPLICATIONS

Organic and inorganic anions, organic acids, organic and inorganic arsenic species

SIZE (mm)	PRP-X100			PRP-X110	PRP-X110S
	5 µm	10 µm	12 – 20 µm	7 µm	7 µm
21.2 x 250, 100 Å	—	—	79353	—	—
4.6 x 250 PEEK	79181	79455	—	79741	—
4.6 x 150 PEEK	79174	79354	—	79738	—
4.1 x 250 SS	—	79433	—	79734	79735
4.1 x 150 SS	79812	79434	—	79732	79733
4.1 x 100 SS	79538	79439	—	—	—
4.1 x 50 SS	79810	79365	—	—	—
2.1 x 250 SS	79190	79346	—	—	—
2.1 x 150 SS	—	79421	—	—	—
2.1 x 150 PEEK	79852	—	—	—	—
2.1 x 100 PEEK	—	—	—	79743	—
Analytical Guard Column	79287	79287	79287	79293	79293
Analytical Guard Cartridge Holder SS	32908	32908	32908	32908	32908
Analytical Guard Cartridge Holder PEEK	79477	79477	79477	79477	79477
Analytical Repl Cartridges SS (5/pk)	79446	79446	79446	79728	79728
Analytical Repl Cartridges PEEK (5/pk)	79385	79385	79385	79729	79729
Analytical Starter Kit ¹ SS	79448	79448	79448	79726	79726
Analytical Starter Kit ¹ PEEK	79383	79383	79383	79727	79727
Prep/Semiprep Guard Column	79913	79913	79913	—	—
Prep/Semiprep Guard Cartridge Holder SS	5095-01	5095-01	5095-01	—	—
Prep/Semiprep Repl Cartridges SS (2/pk)	79126	79126	79126	—	—
Prep/Semiprep Starter Kit ² SS	79125	79125	79125	—	—
DESCRIPTION	5 µm	10 µm	12 – 20 µm	7 µm	7 µm
Bulk Resin (1 gram)	79584	79585	79586	79827	—
Eluent Concentrate PRP-X100 Anion Exchange	79325 79335	(1) 60 mL bottle (6) 60 mL bottles			

1) Analytical Starter Kit includes 1 holder, 2 cartridges

2) Prep/Semiprep Starter Kit includes 1 holder, 1 cartridge

Call Chrom Tech to custom build your Hamilton HPLC column

TECH TIP

The difference between PRP-X110 versus PRP-X110S columns

PRP-X110 columns are equilibrated with a 2 mM p-hydroxybenzoic acid pH 8.5 mobile phase and are ready for use with conductivity or indirect UV detection methods.

PRP-X110S columns are equilibrated with a 1.7 mM sodium bicarbonate, 1.8 mM sodium carbonate, 0.1 mM sodium thiocyanate mobile phase and are ready for use with suppressed conductivity detection methods.

Hamilton PRP-X500 and PRP-X600 Columns | Anion

PRP-X500 is a superficially porous polymeric anion exchange column designed for the separation, purification and isolation of proteins, peptides and DNA/RNA. The methacrylate polymeric coating of the PRP-X500 provides a more hydrophilic surface, preventing hydrophobic interaction sample losses typically seen on other commercially available protein HPLC columns.

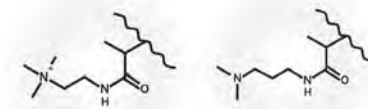
PRP-X600 is a superficially porous weak-base anion exchange support that separates DNA oligomers according to negative charge. Because the PRP-X600 is a weak anion exchange (WAX) resin, the exchange capacity of the resin is pH dependent. Lowering the pH will reduce the binding of proteins, reducing the run time for a complete separation.

Change the mobile phase composition to alter the retention of DNA oligomers. Rapid gradient changes typically lower column efficiency; however, biomolecules run in this fashion on the PRP-X500 show very favorable separation efficiency with much shorter run times.

SIZE (mm)	PRP-X500 7 µm			PRP-X600 7 µm		
4.6 x 150 PEEK	79573			79189		
4.6 x 50 PEEK	79474			79360		
2.1 x 150 PEEK	—			79220		
Analytical Guard Cartridge Holder PEEK	79477			79477		
Analytical Repl Cartridges PEEK (5/pk)	79320			79362		
Analytical Starter Kit ¹ PEEK	79319			79361		
DESCRIPTION	7 µm	12 – 20 µm	30 – 50 µm	7 µm	12 – 20 µm	30 – 50 µm
Bulk Resin (1 gram)	79594	79595	79596	79597	79598	79599

1) Analytical Starter Kit includes 1 holder, 2 cartridges

 Call Chrom Tech to custom build your Hamilton HPLC column



PRP-X500

PRP-X600

SPECIFICATIONS

ANALYTE EXAMPLES

PRP-X500: Myoglobin, Bovine serum albumin, Conalbumin, Ovalbumin

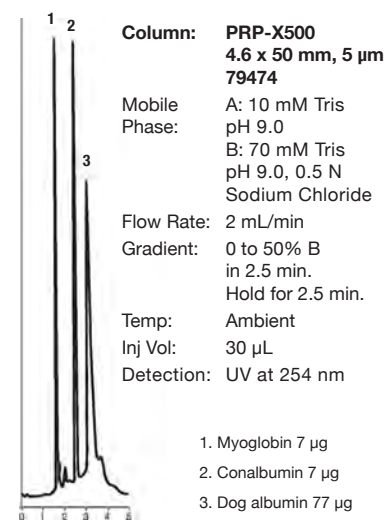
PRP-X600: Synthetic RNA, DNA oligonucleotides, Proteins and peptides, Ovalbumin, DNA fragments, Oligonucleotides

APPLICATIONS

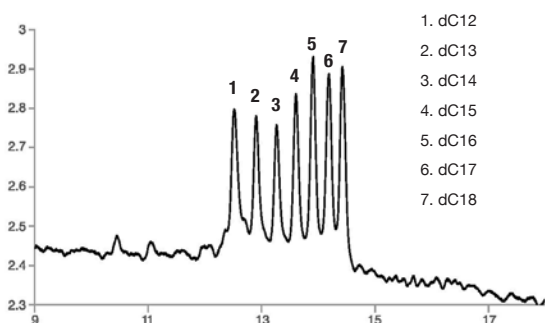
PRP-X500: Proteins/Peptides
Single Stranded/Double Stranded RNA/DNA

PRP-X600: Nucleic acids such as single stranded/double stranded RNA and DNA Peptides and proteins

Myoglobin, Conalbumin and Dog Albumin on PRP-X500



Oligodeoxycytidylate (dc) 12-18 on PRP-X600



Column: PRP-X600
4.6 x 50 mm, 7 µm
79360

Mobile Phase: A: 85/15 100 mM TRIS, pH 8.0/acetonitrile
B: 85/15 100 mM TRIS, pH 8.0, 2.5 M lithium chloride/acetonitrile

Flow Rate: 2 mL/min

Gradient: 0 to 40% B in 40 minutes

Temperature: Ambient

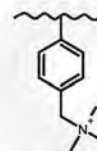
Injection Vol: 10 µL

Sample Concentration: 300 µg/mL

Detection: UV at 260 nm

Hamilton RCX-10 and RCX-30 Columns | Anion

The Hamilton RCX-10 and RCX-30 carbohydrate analysis columns are designed for the isocratic or gradient separation of carbohydrates. The exchange capacity of the RCX-10/RCX-30 is greater than that of the PRP-X100, leading to characteristics better suited for the separation of carbohydrates. Simple samples with two or three carbohydrates can be quickly separated isocratically, while more complex samples require gradient elution to fully resolve all the analytes of interest. When an isocratic method is used with a conductivity, refractive index, ultraviolet, or pulsed amperometric detector (PAD), mono and disaccharides such as glucose, fructose, sucrose and lactose can be quickly determined.



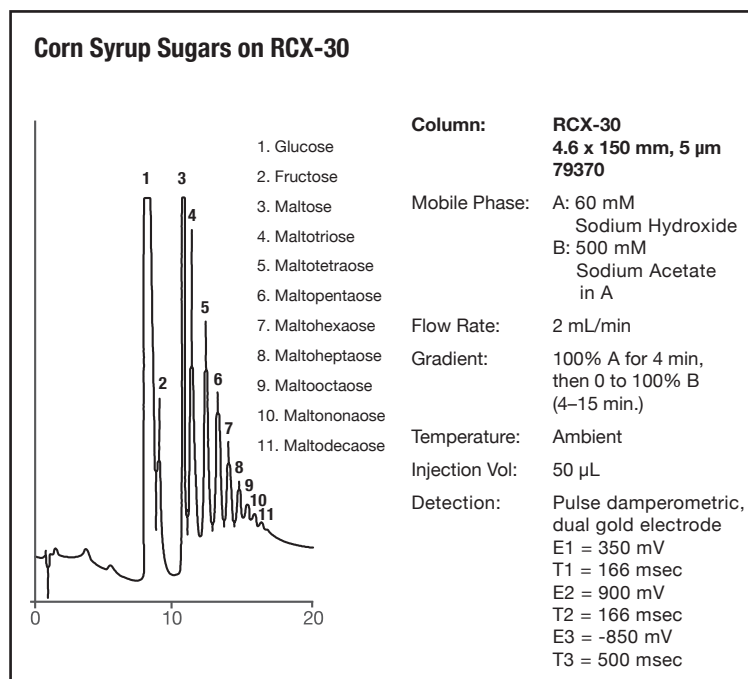
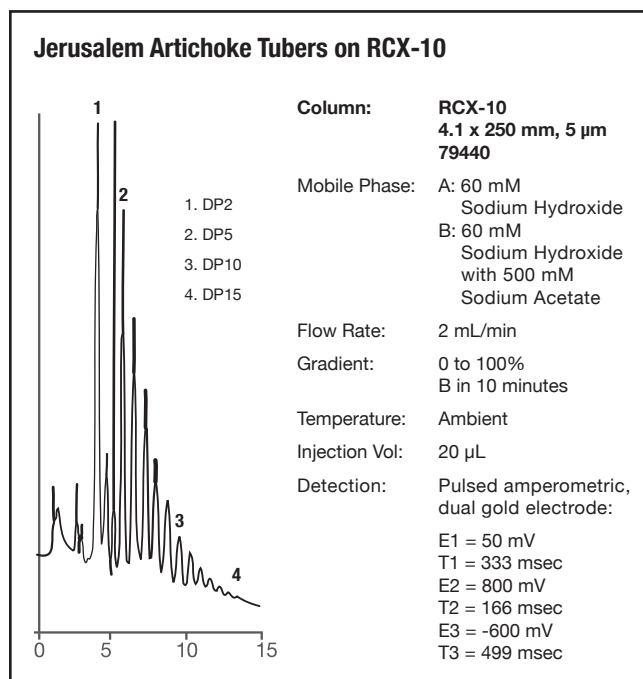
RCX-10/30

SIZE (mm)	RCX-10 7 µm		RCX-30 7 µm	
4.6 x 250 PEEK	79388		79877	
4.6 x 150 PEEK	—		79370	
4.1 x 250 SS	79440		79803	
Analytical Guard Column	79292		—	
Analytical Guard Cartridge Holder SS	32908		—	
Analytical Guard Cartridge Holder PEEK	79477		79477	
Analytical Repl Cartridges SS (5/pk)	79463		—	
Analytical Repl Cartridges PEEK (5/pk)	79379		79372	
Analytical Starter Kit ¹ SS	79462		—	
Analytical Starter Kit ¹ PEEK	79378		79371	
DESCRIPTION	7 µm	12 – 20 µm	7 µm	12 – 20 µm
Bulk Resin (1 gram)	79703	79704	79705	79706

SPECIFICATIONS
ANALYTE EXAMPLES
Arabinose, Galactose, Lactose, Maltose, Sucrose
APPLICATIONS
Carbohydrates, polysaccharides, sugar oligomers up to DP8 mono and disaccharides

1) Analytical Starter Kit includes 1 holder, 2 cartridges

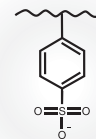
Call Chrom Tech to custom build your Hamilton HPLC column



Hamilton PRP-X200 & PRP-X400 Columns | Cation

Hamilton PRP-X200 cation exchange HPLC columns are designed for rapid, high resolution separation of alkali and alkaline earth metals. The alkali metals and ammonium are completely resolved in less than five minutes, and the alkaline earth cations separate in under four minutes. Since the mobile phase conditions are different and unique for each of the groups of cations, interferences between these groups are eliminated.

The PRP-X400 column provides a fast separation for glyphosate and its metabolites. The exchange capacity of the PRP-X400 is greater than that of the PRP-X200, leading to characteristics better suited for the separation of glyphosate. It also performs well in other separations, such as inositol and sugar alcohols. The column does not have to be heated to 65°C and operates well at room temperature, so a column heater is not necessary for this method. PRP-X400 columns do not require the use of methanol in the mobile phase, and they cost much less than other glyphosate columns.



PRP-X200/X400

SIZE (mm)	PRP-X400 7 µm	PRP-X200 10 µm			
4.6 x 250 PEEK	79387	79357			
4.6 x 150 PEEK	—	79384			
4.1 x 250 SS	79473	79442			
4.1 x 150 SS	79717	79441			
4.1 x 100 SS	—	79363			
2.1 x 250 SS	79398	—			
2.1 x 150 SS	79398	79394			
Analytical Starter Kit ¹ SS	79224	79456			
Analytical Repl Cartridges SS (5/pk)	79225	79449			
Analytical Starter Kit ¹ PEEK	79376	79368			
Analytical Repl Cartridges PEEK (5/pk)	79377	79369			
Analytical Guard Column	79290	79288			
Analytical Guard Cartridge Holder PEEK	79477	79477			
Analytical Guard Cartridge Holder SS	32908	32908			
Prep/Semiprep Guard Column	79916	79914			
Prep/Semiprep Guard Cartridge Holder SS	5095-01	5095-01			
Prep/Semiprep Repl Cartridges SS (2/pk)	79132	79128			
Prep/Semiprep Starter Kit ² SS	79131	79127			
DESCRIPTION	7 µm	12 – 20 µm	30 – 50 µm	10 µm	12 – 20 µm
Bulk Resin (1 gram)	79594	79595	79596	79587	79588

1) Analytical Starter Kit includes 1 holder, 2 cartridges

2) Prep/Semiprep Starter Kit includes 1 holder, 1 cartridge

Call Chrom Tech to custom build your Hamilton HPLC column

SPECIFICATIONS

ANALYTE EXAMPLES

PRP-X200: Calcium, Cesium, Potassium, Sodium

PRP-X400: Glyphosate, Maltose, Xylitol, Mannitol

APPLICATIONS

PRP-X200: Inorganic and organic cations using conductivity or UV detection, alkali and alkaline earth metals. Separate mono or divalent cations depending on mobile phase conditions from 20 ppb to 200 ppm.

PRP-X400: Glyphosate and its metabolite in drinking water. The PRP-X400 provides unique hydrophilic interaction separations. Cations, inorganic and organic using conductivity or UV detection.

Glyphosate on PRP-X400

Column: PRP-X400
4.1 x 250 mm, 5 µm
79473

Mobile Phase: 0.005 M Monobasic potassium phosphate

Flow Rate: 0.5 mL/min

Gradient: Isocratic

Temperature: Ambient

Injection Vol: 200 µL

Detection: Excitation λ—338 nm, Emission λ—455 nm

1. Glyphosate
2. Aminomethylphosphonic acid

Monovalent Cations on PRP-X200

Column: PRP-X200
4.1 x 150 mm, 5 µm
79441

Mobile Phase: (2.3:1) 4 mM Nitric acid:Methanol

Flow Rate: 2 mL/min

Gradient: Isocratic

Temperature: Ambient

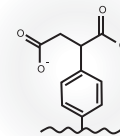
Injection Vol: 100 µL

Detection: Conductivity

1. Lithium
2. Sodium
3. Ammonium
4. Potassium
5. Cesium

Hamilton PRP-X800 Columns | Cation

The PRP-X800 is a polymeric cation exchange column functionalized with itaconic acid that performs the isocratic separation of mono and divalent cations such as lithium, sodium, ammonium, potassium, magnesium and calcium. The column offers excellent durability, is stable to any concentration organic solvent, and enables dynamic control of exchange capacity. Detection is via conductivity or indirect UV, depending on the mobile phase.



PRP-X800

SIZE (mm)	7 µm
4.1 x 250 SS	79828
4.1 x 150 SS	79855
Analytical Guard Column	79294
Analytical Guard Cartridge Holder SS	32908
Analytical Guard Cartridge Holder PEEK	79477
Analytical Repl Cartridges SS (5/pk)	79832
Analytical Repl Cartridges PEEK (5/pk)	79833
Analytical Starter Kit ¹ SS	79830
Analytical Starter Kit ¹ PEEK	79831

1) Analytical Starter Kit includes 1 holder, 2 cartridges

Call Chrom Tech to custom build your Hamilton HPLC column

SPECIFICATIONS

ANALYTE EXAMPLES

Mono and divalent metal cations (e.g., sodium, potassium, calcium)
Transition metals (e.g., iron, manganese, nickel, copper, zinc)

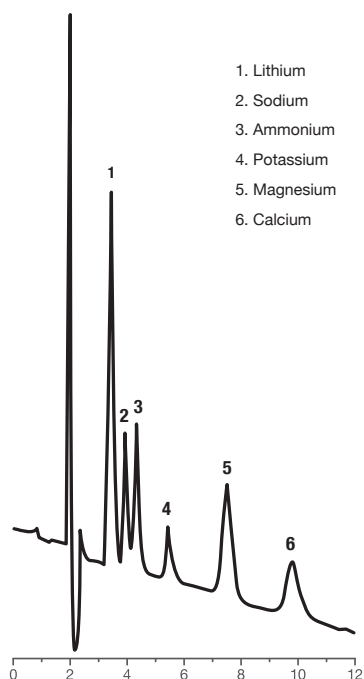
APPLICATIONS

Mono and divalent transition metals in the same run. Transition metals (e.g., manganese, zinc, cobalt and cadmium) are also resolved on the column using an ethylenediamine/tartaric acid mobile phase and conductivity detection.

TECH TIP

The PRP-X800 is available in PEEK hardware as a custom order. Contact Chrom Tech for more information.

Mono and Divalent Cations on PRP-X800



1. Lithium
2. Sodium
3. Ammonium
4. Potassium
5. Magnesium
6. Calcium

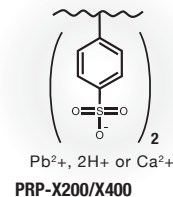
Column: **PRP-X800**
4.1 x 250 mm, 5 µm
79828

Mobile Phase: 2 mM Cupric Sulfate
Flow Rate: 0.8 mL/min
Gradient: Isocratic
Temperature: Ambient
Injection Vol: 10 µL
Sample Concentration: All compounds are 5 ppm
Detection: Indirect UV at 220 nM

Hamilton HC-40 Ca²⁺ and HC-75 (H⁺, Ca²⁺, Pb²⁺) Columns | Cation

HC-40 columns separate compounds through size exclusion. The 4% cross-linked HC-40 uses size exclusion as the primary mechanism of separation. The larger carbohydrate oligomers elute first while the smaller di- and monosaccharaides elute later.

HC-75 columns separate compounds through ligand exchange. The 8% cross-linked HC-75 uses ligand exchange as the primary mechanism of separation. The different forms of the HC-75 (Hydrogen, Calcium and Lead) each provide a unique selectivity for separating varying types of charged analytes based on electronegativity toward the counterion. The larger carbohydrate oligomers elute first while the smaller di- and monosaccharaides elute later.



Size (mm)	HC-40 (Ca ²⁺)		HC-75 (Ca ²⁺)	HC-75 (H ⁺)	HC-75 (Pb ²⁺)
	9 μm	10 – 15 μm	9 μm	9 μm	9 μm
7.8 x 305 SS	—	79432	79436	—	79438
7.8 x 100 SS	—	—	—	79547	79240
4.1 x 250 SS	—	—	79431	79476	—
Prep/Semiprep Guard Column	—	—	79919	79917	—
Prep/Semiprep Guard Cartridge Holder SS	—	—	5095-01	5095-01	—
Prep/Semiprep Repl Cartridges SS (2/pk)	—	—	79865	79134	—
Prep/Semiprep Starter Kit ¹ SS	—	—	79866	79133	—
DESCRIPTION	9 μm	10 – 15 μm	9 μm	9 μm	9 μm
Bulk Resin (1 gram)	79707	—	79709	79711	79712

1) Prep/Semiprep Starter Kit includes 1 holder, 1 cartridge

SPECIFICATIONS

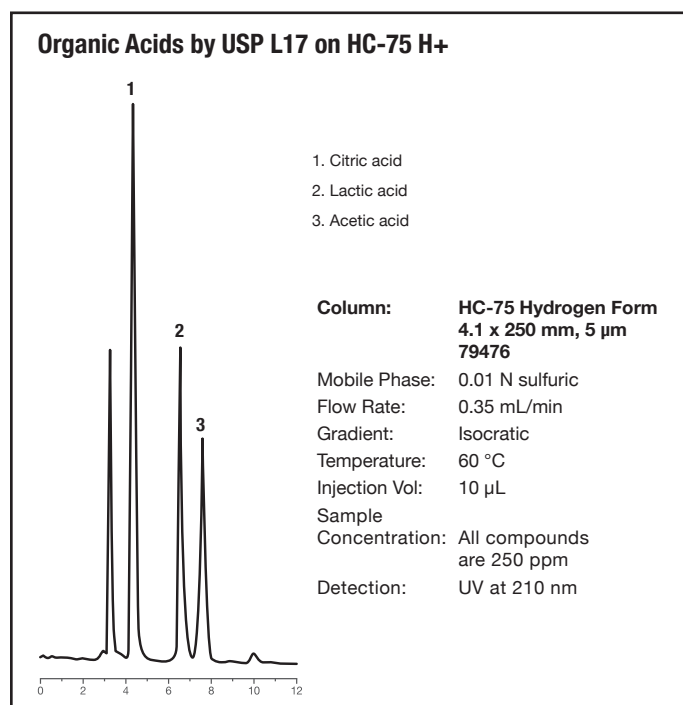
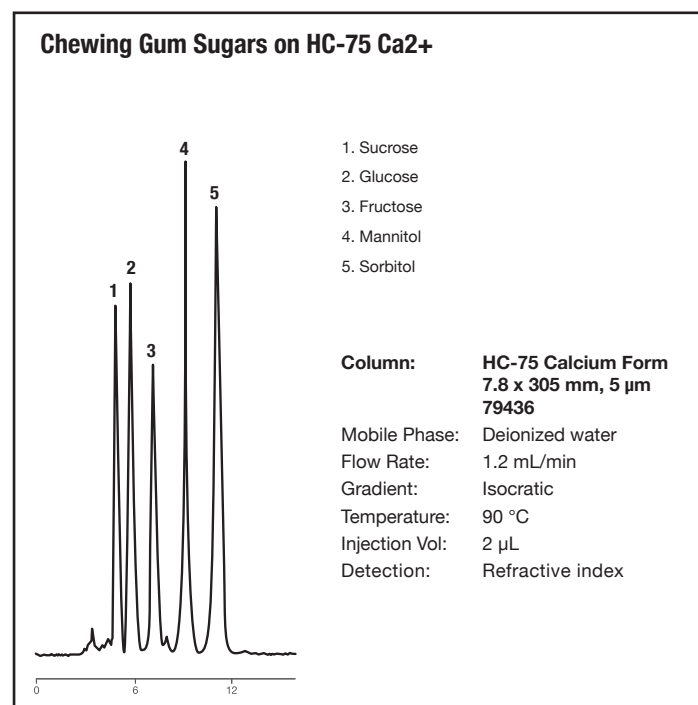
ANALYTE EXAMPLES

Ethanol, Maltose, citric acid, Glucose, fructose, Arabinose, Sorbitol, Acetic acid

APPLICATIONS

Carbohydrates, sugar oligomers up to DP8. Mono and disaccharides, organic acids, sugars, and sugar alcohols

Call Chrom Tech to custom build your Hamilton HPLC column



Hamilton Ion Exclusion HPLC Columns | Specification Chart

HAMILTON ION EXCLUSION COLUMNS							
PACKING NAME	SUPPORT MATERIAL	EXCHANGE CAPACITY	PORE SIZE	TEMP. LIMITS	MOBILE PHASE LIMITS	BUFFER STRENGTH	MAXIMUM PRESSURE
PRP-X300	PSDVB* Sulfonate Exchanger	0.17meq/gm	100 Å	5-60 °C	pH 1-13. 0-100% aqueous, organic modifier	0.0-0.5N	5,000 PSI

*PSDVB is Poly(styrene-divinylbenzene)

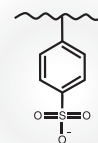
Hamilton PRP-X300 | Ion Exclusion

Hamilton PRP-X300 columns offer an easy, rapid way to separate closely related alcohols and organic acids. The sulfonated poly(styrene-divinylbenzene) support separates samples via a mixed mode mechanism. Separation on the PRP-X300 is accomplished by three modes:

Hydrogen Bonding—The attraction and retention of sample compounds by the negatively charged sulfonate group.

Reversed-Phase—The interaction and retention of the sample compounds by the non-polar polymeric support.

Ion Exclusion—The process in which ionized samples are excluded from the pores of the support and elute first, while the weakly ionized and nonionic compounds elute later.



PRP-X300

SIZE (mm)	7 µm
4.6 x 150 PEEK	79475
4.1 x 150 SS	79464
4.1 x 250 SS	79465
Analytical Guard Column	79289
Analytical Guard Cartridge Holder SS	32908
Analytical Guard Cartridge Holder PEEK	79477
Analytical Repl Cartridges SS (5/pk)	79453
Analytical Repl Cartridges PEEK (5/pk)	79374
Analytical Starter Kit ¹ SS	79460
Analytical Starter Kit ¹ PEEK	79373
Prep/Semiprep Guard Column	79915
Prep/Semiprep Guard Cartridge Holder SS	5095-01
Prep/Semiprep Repl Cartridges SS (2/pk)	79130
Prep/Semiprep Starter Kit ² SS	79129

DESCRIPTION	7 µm	12 – 20 µm
Bulk Resin (1 gram)	79589	79590

1) Analytical Starter Kit includes 1 holder, 2 cartridges 2) Prep/Semiprep Starter Kit includes 1 holder, 1 cartridge

Call Chrom Tech to custom build your Hamilton HPLC column

SPECIFICATIONS

ANALYTE EXAMPLES

Acetic acid, Acrylamide, Citric acid, Oxalacetic acid, Ethanol, Propanol

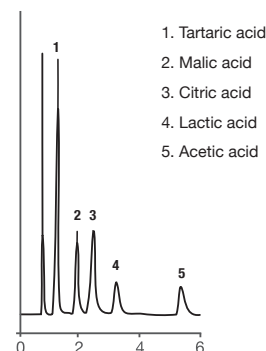
APPLICATIONS

Organic acids and alcohols

Organic Acids on PRP-X300

Column: PRP-X300
4.1 x 100 mm, 3 µm
79818

Mobile Phase: 1 mN Sulfuric acid
Flow Rate: 1 mL/min
Gradient: Isocratic
Temperature: Ambient
Injection Vol: 20 µL
Detection: UV at 201 nm



Imtakt Presto FF-C18

- ➔ High resolution 2 µm non-porous ODS column
- ➔ Reversed-phase separation for bio- and synthetic-polymers up to 30 MDa
- ➔ Different selectivity from porous ODS columns
- ➔ High-efficiency with low flow rate compatible with conventional HPLC systems

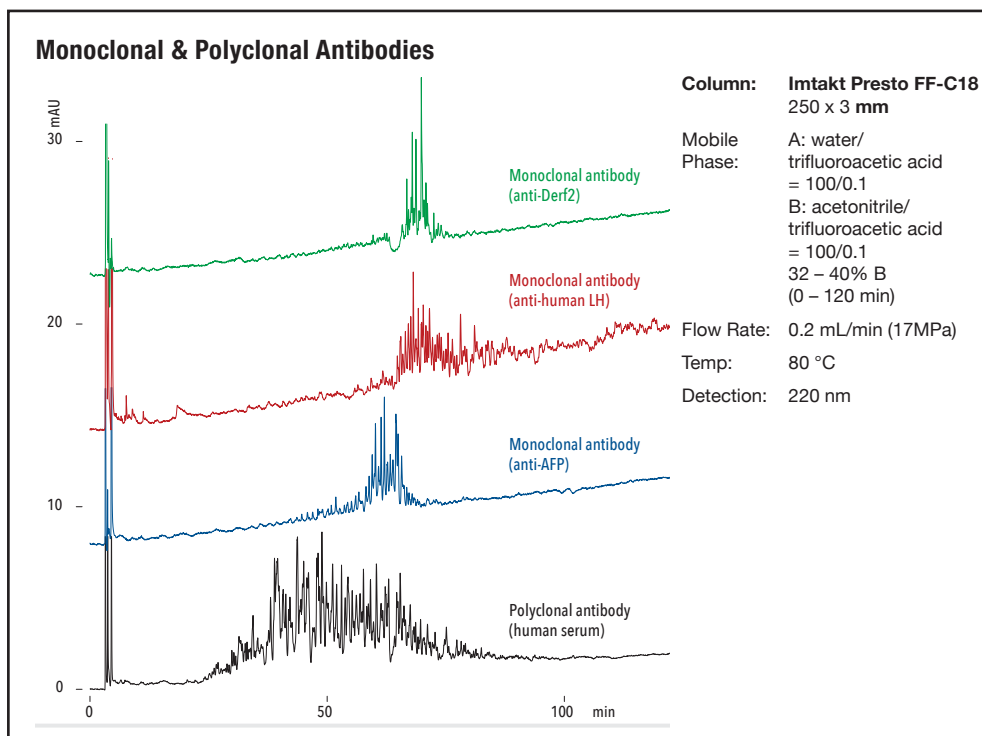
Imtakt has developed a novel 2 µm, non-porous, high resolution ODS column. There are several shortcomings for porous ODS columns for polymer separation:

- ➔ Poor peak shape of solutes due to wide range in pore size distribution
- ➔ Poor recovery of solutes due to micro-pores and meso-pores
- ➔ Reduced column efficiency due to high mass transfer resistance

Presto FF-C18 can overcome these shortcomings for polymer separation. This high resolution, non-porous ODS column is quite different from conventional ODS columns, and will create new opportunities for 21st century separation science.

IMTAKT PRESTO FF-C18 2 µm NON-POROUS SILICA, OCTADECYL LIGAND, END-CAPPED						
LENGTH (mm)	1 mm ID	2 mm ID	3 mm ID	4.6 mm ID	6 mm ID	10 mm ID
250	FF016	FF026	FF036	FF006	FF066	FF0P6
150	FF015	FF025	FF035	FF005	FF065	FF0P5
100	FF014	FF024	FF034	FF004	FF064	FF0P4
75	FF013	FF023	FF033	FF003	FF063	FF0P3
50	FF012	FF022	FF032	FF002	FF062	FF0P2
30	FF011	FF021	FF031	FF001	FF061	FF0P1
20	—	FF029	FF039	FF009	—	—
10	—	FF020	FF030	FF000	—	—

Micro/Nano columns are also available



TECH TIP

Recommendations for Presto FF-C18

Presto FF-C18 is a non-porous ODS column consisting of 2 µm non-porous silica particles. The specific surface area is much lower than conventional porous ODS columns. As a result, eluent composition should be optimized in order to obtain retention equivalent to a porous ODS column. Presto FF-C18 works great at low flow rates and can be used on conventional HPLC systems. Higher flow rates (i.e. same flow rate as porous ODS column) will require the use of an UHPLC system.

Mobile Phase Composition

Retention is greatly reduced on non-porous ODS due to its extremely low surface area. In order to get similar retention to porous ODS, organic solvent ratio should be reduced.

Flow Rate

Because Presto FF-C18 is non-porous (and thus no diffusion in pores), excellent performance is also achieved at lower flow rates and improves resolution and sensitivity.

Retention of Polar Compounds

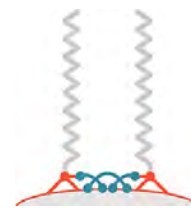
Presto FF-C18 has a disadvantage for isocratic elution due to low surface area. It is therefore recommended to use gradient elution as often as possible.

Recommendations for HPLC Operation

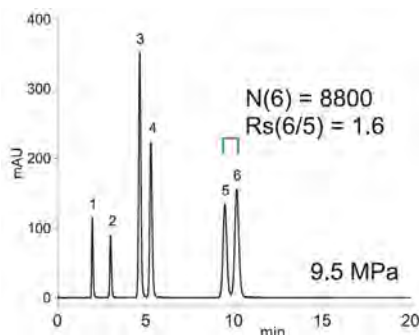
It is recommended that low dispersion systems and high pressure binary pumps are used with Presto FF-C18.

Imtakt Cadenza CD-C18

- Unique ligand density provides excellent steric selectivity
- High efficiency 3 µm column with low back-pressure
- Excellent for impurity testing or isomer separation
- Selectivity ideal for small molecule pharmaceutical testing or drugs of abuse



Isomer Separation



Column: Imtakt Cadenza CD-C18
CDO23U
2.0 x 75 mm, 3.0 µm

Mobile Phase: MeOH/water = 55/45

Flow Rate: 0.2 mL/min

Temp: 30 °C

Detection: UV, 270 nm

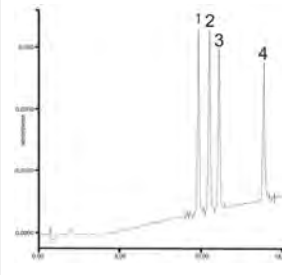
1. methylparaben
2. ethylparaben
3. isopropylparaben
4. propylparaben
5. isobutylparaben
6. butylparaben

Cadenza CD-C18 excels at separating structural isomers.

As shown in this separation example, when one compares the separation of paraben isomer structures such as propylparabens and butylparabens, Cadenza provides more plates and better resolution in half the column length.

Cadenza CD-C18 offers quicker results and greater sensitivity under the same separation conditions used for a conventional column.

Steroid Separation



1. androstene-3, 17 -dione

2. testosterone

3. α-hydroxyprogesterone

4. progesterone

Column: Imtakt Cadenza CD-C18
CDO23U
75 x 2 mm, 3.0 µm

Mobile Phase: A: 10% methanol,
B: methanol 30
50% B (0 – 0.5 min) 100% B (12.5 min)

Flow Rate: 0.3 mL/min

Detection: UV, 260 nm

IMTAKT CADENZA CD-C18 - 3 µm

COLUMN ID	GUARD HOLDER	GUARD CARTRIDGE	10 mm	20 mm	30 mm	50 mm	75 mm	100 mm	150 mm	250 mm
CADENZA CD-C18 3 µm – PRESSURE LIMIT UP TO 15,000 PSI (1,034 BAR)										
2.0 mm	GCH01S	GCCD0S	–	–	CD021U	CD022U	CD023U	CD024U	CD025U	CD026U
CADENZA CD-C18 3 µm PRESSURE LIMIT UP TO 7,500 PSI (517 BAR)										
4.6 mm	GCH01S	GCCD0S	CD000T	CD009T	CD001T	CD002T	CD003T	CD004T	CD005T	CD006T
3.0 mm	GCH01S	GCCD0S	CD030T	CD039T	CD031T	CD032T	CD033T	CD034T	CD035T	CD036T
2.0 mm	GCH01S	GCCD0S	CD020T	CD029T	CD021T	CD022T	CD023T	CD024T	CD025T	CD026T
1.5 mm	GCH01S	GCCD0C	–	–	CD071T	CD072T	CD073T	CD074T	CD075T	CD076T
1.0 mm	GCH01S	GCCD0C	–	–	CD011T	CD012T	CD013T	CD014T	CD015T	CD016T
CADENZA CD-C18 5 µm PRESSURE LIMIT UP TO 3,000 PSI (206 BAR)										
28.0 mm	GCH02M	GC5CD0M	–	–	–	–	–	–	–	5CD0R6
20.0 mm	GCH02M	GC5CD0M	–	–	–	5CD0Q2	–	5CD0Q4	5CD0Q5	5CD0Q6
10.0 mm	GCH02M	GC5CD0M	–	–	5CD0P1	5CD0P2	5CD0P3	5CD0P4	5CD0P5	5CD0P6
6.0 mm	GCH01S	GC5CD0S	–	–	5CD061	5CD062	5CD063	5CD064	5CD065	5CD066
4.6 mm	GCH01S	GC5CD0S	–	–	5CD001	5CD002	5CD003	5CD004	5CD005	5CD006
4.0 mm	GCH01S	GC5CD0S	–	–	–	–	–	–	5CD045	5CD046
3.0 mm	GCH01S	GC5CD0S	–	–	5CD031	5CD032	5CD033	5CD034	5CD035	5CD036
2.0 mm	GCH01S	GC5CD0S	–	–	5CD021	5CD022	5CD023	5CD024	5CD025	5CD026
1.5 mm	GCH01S	GC5CD0C	–	–	5CD071	5CD072	5CD073	5CD074	5CD075	5CD076
1.0 mm	GCH01S	GC5CD0C	–	–	5CD011	5CD012	5CD013	5CD014	5CD015	5CD016

All of Imtakt stationary phases can also be made in the following internal diameters: 0.05 mm, 0.075 mm, 0.1 mm, 0.3 mm, and 0.5 mm.

Intrada Amino Acids Separation Column

The world's first specialty column for intact amino acid analysis via LC-MS

- ➔ LC-MS Analysis of amino acids—**No derivatization required**
- ➔ Pure 3 μm spherical silica phase designed for amino acid analysis

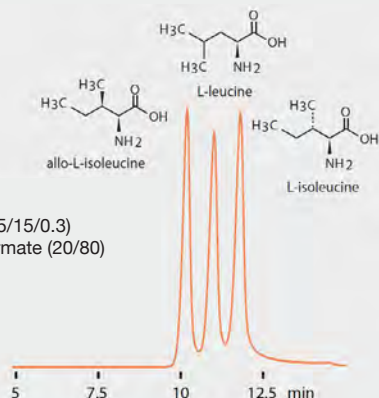
Intrada Amino Acid high-throughput columns provide amazing speed, selectivity, and convenience. The next generation amino acid analysis method for clinical amino acid biomarkers, fermented materials, and botanical amino acids is here.

Separation of Leucine (131Da) isomers

Intrada Amino Acid 150 x 3 mm

12 – 13% B (0–12 min)
100% B (12 – 15 min)
0.4 mL/min (11 MPa)
35 °C, 5 μL (0.1N HCl)
ESI (positive, m/z 132.0)

A: MeOH/Water/Formic acid (85/15/0.3)
B: ACN/100mM Ammonium formate (20/80)



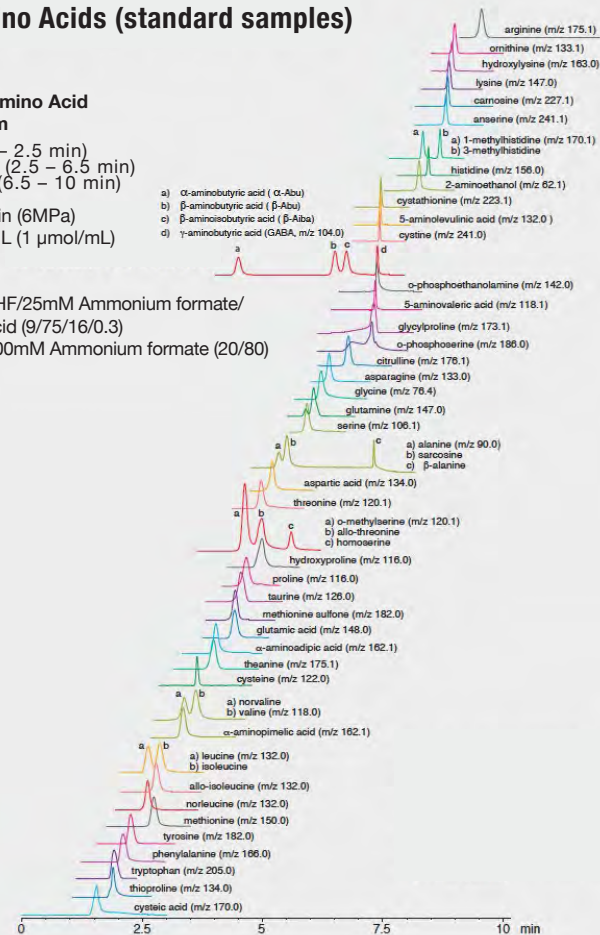
55 Amino Acids (standard samples)

Intrada Amino Acid 50 x 3 mm

0% B (0 – 2.5 min)
0–17% B (2.5 – 6.5 min)
100% B (6.5 – 10 min)
0.6 mL/min (6MPa)
35 °C, 5 μL (1 μmol/mL)

ESI (SIM)

A: ACN/THF/25mM Ammonium formate/
Formic acid (9/75/16/0.3)
B: ACN/100mM Ammonium formate (20/80)

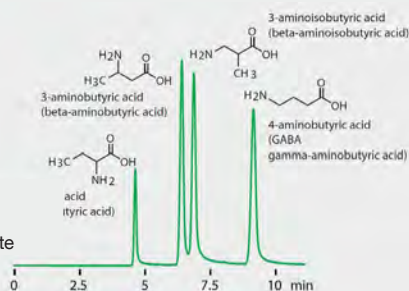


Separation of GABA (103Da) isomers

Intrada Amino Acid 100 x 3 mm

25 – 30% B (0 – 12 min)
100% B (12 – 15 min)
0.4 mL/min (4MPa)
37 °C, 5 μL (0.1N HCl)

ESI (positive, m/z 104.1)
A: ACN/Formic acid (100/0.3)
B: 100mM Ammonium formate



Intrada Amino Acid columns separate amino acid isomers quickly by using an optimized column length, as in the example of aminobutyric acid isomers (103Da) and leucine isomers (131Da) using 100–150mm length columns.

IMTAKT INTRADA AMINO ACID

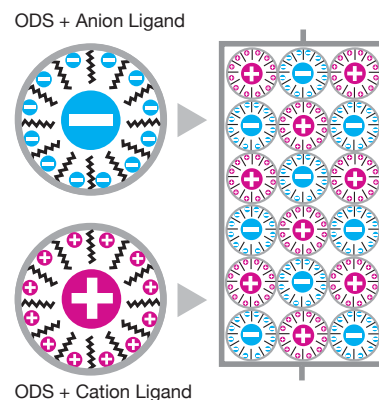
COLUMN ID	10 mm	20 mm	30 mm	50 mm	75 mm	100 mm	150 mm	250 mm
3.0 mm	WAA30	WAA39	WAA31	WAA32	WAA33	WAA34	WAA35	WAA36
2.0 mm	WAA20	WAA29	WAA21	WAA22	WAA23	WAA24	WAA25	WAA26
1.0 mm	—	—	WAA11	WAA12	WAA13	WAA14	WAA15	WAA16

All of Imtakt stationary phases can also be made in the following internal diameters: 0.05 mm, 0.075 mm, 0.1 mm, 0.3 mm, and 0.5 mm.

Scherzo C18 Multi-Mode Column

The Scherzo C18 Family (SS-C18, SM-C18, SW-C18), consists of not only ODS ligands, but also anion ligands and cation ligands. It also provides reversed-phase modes, both ion exchange modes, and normal phase mode.

Separation Mode	Stationary Phase	Properties
Reversed Phase +	Octadecyl	Increasing organic solvent composition (decreasing polarity of eluent) decreases retention.
Anion Exchange +	Cation	Increasing ionic strength (salt or acid concentration) decreases retention for acidic compounds. Generally, low pH increases retention.
Cation Exchange +	Anion	Increasing salt concentration decreases retention for basic compounds. SM-C18 retains more with increasing pH, while SS-C18 and SW-C18 retain more at lower pH.
Normal Phase	Anion/Cation	Polar solutes which cannot be retained with 100% aqueous eluent may be retained by using > 50% organic solvent composition due to electrostatic interaction.



Three kinds of ODS with different ion exchange capacities

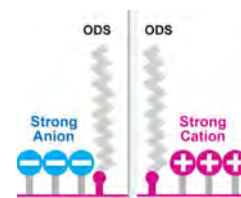
IMTAKT SCHERZO SS-C18									
COLUMN ID	10 mm	20 mm	30 mm	50 mm	75 mm	100 mm	150 mm	250 mm	500 mm
10.0 mm	—	—	SS0P1	SS0P2	SS0P3	SS0P4	SS0P5	SS0P6	—
6.0 mm	—	—	SS061	SS062	SS063	SS064	SS065	SS066	—
4.6 mm	SS000	SS009	SS001	SS002	SS003	SS004	SS005	SS006	SS007
3.0 mm	SS030	SS039	SS031	SS032	SS033	SS034	SS035	SS036	—
2.0 mm	SS020	SS029	SS021	SS022	SS023	SS024	SS025	SS026	—
1.5 mm	—	—	SS071	SS072	SS073	SS074	SS075	SS076	—
1.0 mm	—	—	SS011	SS012	SS013	SS014	SS015	SS016	—

IMTAKT SCHERZO SM-C18									
COLUMN ID	10 mm	20 mm	30 mm	50 mm	75 mm	100 mm	150 mm	250 mm	500 mm
10.0 mm	—	—	SM0P1	SM0P2	SM0P3	SM0P4	SM0P5	SM0P6	—
6.0 mm	—	—	SM061	SM062	SM063	SM064	SM065	SM066	—
4.6 mm	SM000	SM009	SM001	SM002	SM003	SM004	SM005	SM006	SM007
3.0 mm	SM030	SM039	SM031	SM032	SM033	SM034	SM035	SM036	—
2.0 mm	SM020	SM029	SM021	SM022	SM023	SM024	SM025	SM026	—
1.5 mm	—	—	SM071	SM072	SM073	SM074	SM075	SM076	—
1.0 mm	—	—	SM011	SM012	SM013	SM014	SM015	SM016	—

SCHERZO SW-C18									
COLUMN ID	10 mm	20 mm	30 mm	50 mm	75 mm	100 mm	150 mm	250 mm	500 mm
10.0 mm	—	—	SW0P1	SW0P2	SW0P3	SW0P4	SW0P5	SW0P6	—
6.0 mm	—	—	SW061	SW062	SW063	SW064	SW065	SW066	—
4.6 mm	SW000	SW009	SW001	SW002	SW003	SW004	SW005	SW006	SW007
3.0 mm	SW030	SW039	SW031	SW032	SW033	SW034	SW035	SW036	—
2.0 mm	SW020	SW029	SW021	SW022	SW023	SW024	SW025	SW026	—
1.5 mm	—	—	SW071	SW072	SW073	SW074	SW075	SW076	—
1.0 mm	—	—	SW011	SW012	SW013	SW014	SW015	SW016	—

All of Intakt stationary phases can also be made in the following internal diameters: 0.05 mm, 0.075 mm, 0.1 mm, 0.3 mm, and 0.5 mm.

Scherzo SS-C18



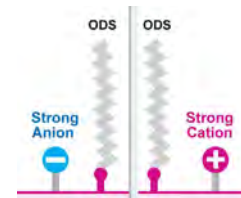
Large amount of strong ionic ligands loaded onto this ODS column. Effective for improved retention of zwitterions or weak ionic compounds.

Scherzo SM-C18



Weak ionic ligands adequately loaded onto this ODS column. Designed for separation of basic/acidic compounds at neutral pH condition.

Scherzo SW-C18



Low amount of strong ionic ligands loaded onto this ODS column. Effective for strong ionic compound elution or basic compounds with formic acid eluent.

Jordi Resolve 5 µm Organic GPC Columns

- ➔ No dislocations in pore distribution
- ➔ Clean light scattering background
- ➔ Highly symmetrical peaks
- ➔ Improved calibration
- ➔ Stable up to 220 °C
- ➔ Low back pressure
- ➔ Monodisperse polymer particles
- ➔ 100% Divinylbenzene (DVB)

Jordi Labs has recently developed a novel packing material for GPC systems. This column packing is based on 100% divinylbenzene providing enhanced mechanical stability and utilizes a new synthetic process which results in a monodisperse polymer column packing. It is well known that broad particle size distributions in particle based columns produces variations in packing density, lowers column resolution, reduces the column permeability and generates high back pressure. New generation Jordi GPC columns prepared with monodisperse 100% divinylbenzene particles with precisely controlled particle diameter and finely controlled pore structure provide high efficiency, high separation capacity and low back pressure with greater bed stability. Scanning electron micrographs and particle size distribution of 5 µm macroporous column packing material with 10³ Å pore sizes are shown in Figure 1. The uniform size distribution and perfect spherical shapes are clearly seen.

To maximize GPC resolution, the key is to use a column containing the maximum number of pores of the desired size to separate the molecular weight range of interest. New generation individual pore size Jordi Resolve columns 5 µm (7.8 mm ID x 300 mm L) provide high resolution in specific molecular weight ranges.

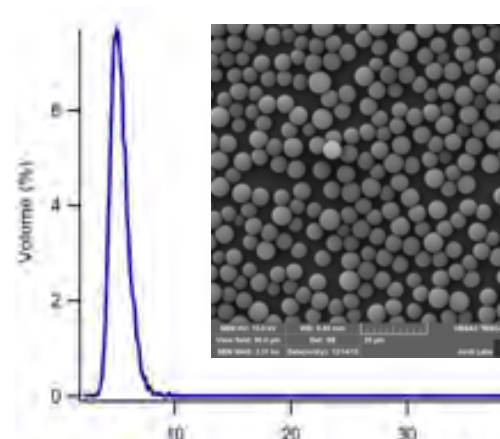
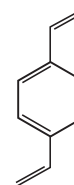


Figure 1: SEM and particle size distribution of Jordi Resolve 5 µm column packing material.

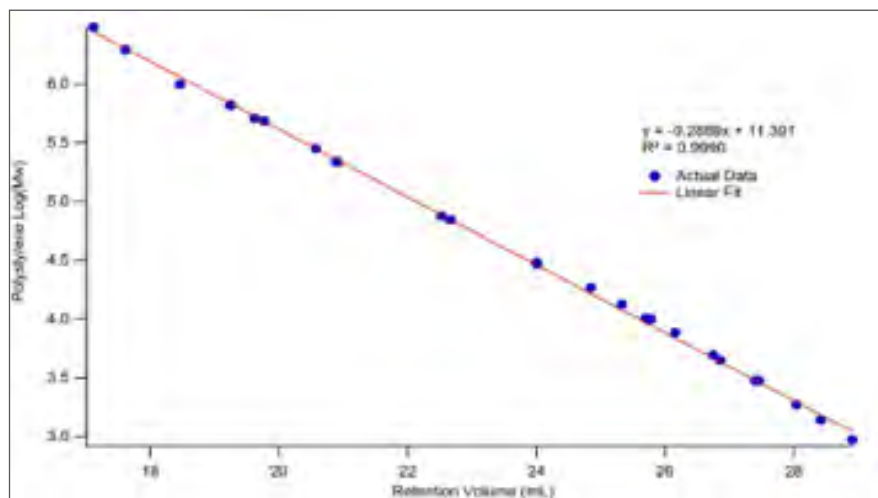


Figure 2: Resolve Mixed Bed Calibration Curve

The linear part of each calibration curve defines the molecular weight range of each individual porosity column. To cover a wider range of molecular weight with a constant resolution for the analysis of polydisperse or unknown materials, Jordi Labs designed mixed bed Resolve column 5 µm (7.8 mm ID x 300 mm L). Mixed bed Resolve column allows separation over the molecular weight range from 200 to 3,000,000 g/mol (PS equivalent) with a coefficient of determination (R²) of 0.999, as shown in Figure 2, and an industry leading specification of 70,000 theoretical plates. In addition, high pore volume of Jordi Resolve column provides an increased resolution compared to the competitive column of the same particle size and length. Accurate blending of individual pore sizes and therefore, the wide molecular weight resolving range of Jordi Resolve column provides smooth peak shapes.

JORDI RESOLVE 5 µm ORGANIC GPC COLUMNS					
PART NO	POROSITY	PORE SIZE	SIZE (mm)	PRESSURE	MW RANGE
R15070	100 Å	5 µm	7.8 x 300	8,000 PSI	200 – 10K
R15071	500 Å	5 µm	7.8 x 300	8,000 PSI	200 – 15K
R15072	10 ³ Å	5 µm	7.8 x 300	8,000 PSI	500 – 50K
R15073	10 ⁴ Å	5 µm	7.8 x 300	2,000 PSI	30K – 600K
R15074	10 ⁵ Å	5 µm	7.8 x 300	2,000 PSI	70K – 3M
R15075	Mixed Bed Low	5 µm	7.8 x 300	2,000 PSI	200 – 600K
R15076	Mixed Bed Medium	5 µm	7.8 x 300	2,000 PSI	200 – 3M

Jordi Resolve 13 μm Organic GPC Column

- 13 μm particle optimized for the high temperature molecular weight analysis of polyethylene and other polyolefins

For higher molecular weights, Jordi Labs offers its Jordi Resolve DVB 13 μm columns. New generation Jordi Resolve columns are produced to allow separation over the molecular weight range from 500 to 12,000,000 g/mol (PS equivalent). Polyolefins often have broad molecular weight ranges characterized by high polydispersity values. Jordi Labs has developed mixed bed columns especially for these broad distribution samples which were designed by blending a large number of individual pore size packing materials.

To maximize GPC resolution, the key is to use a column containing the maximum number of pores of the desired size to separate the molecular weight range of interest. New generation Jordi Resolve columns are produced to allow separation over the molecular weight range from 160 to 11,000,000 g/mol (PS equivalent) for 13 μm particle size packing materials. Polyolefins often have broad molecular weight ranges characterized by high polydispersity values. Jordi Mixed bed 13 μm columns have highly linear calibration curves with a coefficient of determination (R²) of 0.999 over the molecular weight range 160-11,600,000 g/mol (PS equivalent). These columns have the ability to separate very broad samples without peak dislocations/shoulders for highly polydisperse samples. Analysis of NIST polyethylene standards including NIST 2887, 1475a and 1476a along with industry samples of polypropylene, polyethylene and polystyrene have been performed to demonstrate column performance at elevated temperatures (160 °C).

The large particle size of the new Jordi 13 μm column provides high efficiency and minimum shear degradation for high molecular weight polymers. Polyethylene samples analyzed in trichlorobenzene at 160 °C are shown in Figure 3.

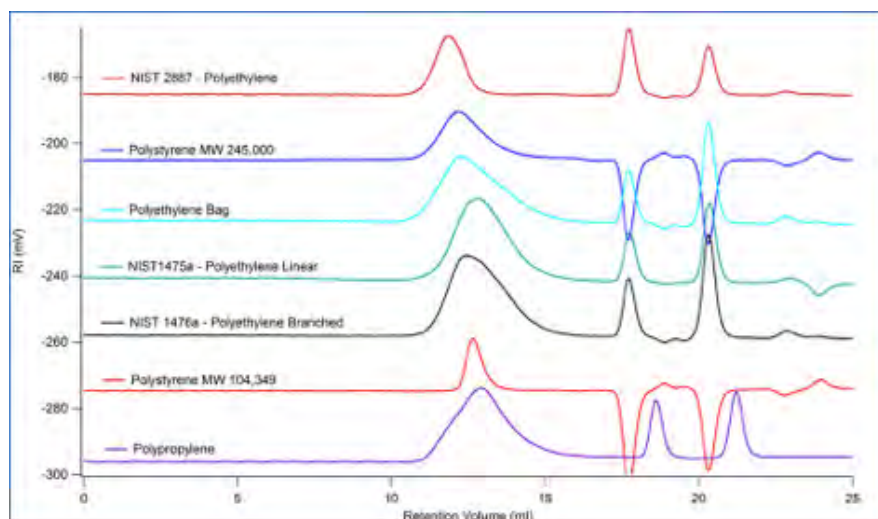


Figure 3: Chromatograms obtained with Resolve 13 μm (7.8mm x 300mm) column for PE and related samples at 160 °C.

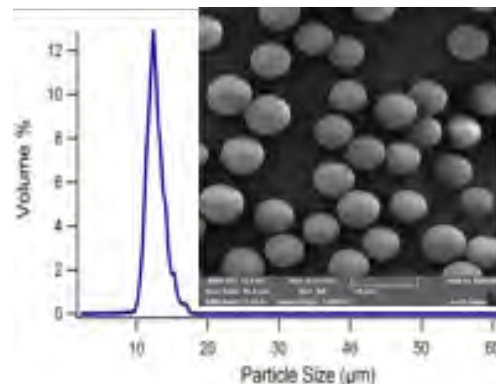


Figure 1: SEM and particle size distributions of 13 μm resin

It is well known that broad particle size distributions in particle based columns produces variations in packing density, lowers column resolution, reduces the column permeability and generates high back pressure. New generation Jordi GPC columns prepared with monodisperse 100% divinylbenzene particles with precisely controlled particle diameter and finely controlled pore structure provide high efficiency, high separation capacity and low back pressure with greater bed stability. Scanning electron micrographs and particle size distributions of 13 μm macroporous column packing materials with 10³ Å pore sizes are shown in Figure 1.

Why Jordi Resolve Columns?

- Improved regularity
- Increased separation efficiency
- Highly linear calibration means increased accuracy
- Measures every MW between 500 and 12 million

What makes our new columns better?

- Monodisperse bead size
- Novel 100% DVB column packing
- Enhanced mechanical stability

For what industries are these columns best suited?

- Petroleum
- Chemical
- Consumer Product Goods

What are some common applications for Jordi Resolve Columns?

- High molecular weight polymers
- Polyethylene and Polypropylene at high temperature

JORDI RESOLVE 13 μm ORGANIC GPC COLUMNS

PART NO	POROSITY	PORE SIZE	SIZE (mm)	PRESSURE	MW RANGE
R15077	Mixed Bed High	13 μm	7.8 x 300	2,000 PSI	500 - 12M

Jordi Resolve Aqueous GPC Columns

Jordi offers three column chemistries for GPC in aqueous mobile phases including:

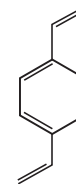
- Jordi Resolve xStream
- Jordi Resolve Anion
- Jordi Resolve Cation

Aqueous applications present a significant challenge in the field of size-based separations, due to the difficulty in preventing sample-column interactions. Jordi offers a wide selection of column packings to ensure success in your aqueous SEC separation. Jordi Resolve xStream columns allow for the separation of a wide range of samples in 100% aqueous, 100% organic or aqueous/organic mobile phases. Our Resolve Anion and Resolve Cation columns separate cationic and anionic samples based on charge-charge repulsions, without the need for high salt concentrations. Jordi Resolve xStream columns apply to a wide range of neutral, polar synthetic polymers and polysaccharides in mixed mobile phases, such as DMSO/H₂O. The extreme inertness of these packings extends their use to strongly basic mobile phases, including 1M NaOH, that would destroy the competitors methacrylate-based products. The Jordi Resolve xStream column packing is an exciting breakthrough technology, which has increased hydrophilicity to reduce sample-column interactions. This novel resin features 100% polymeric polyamide chemistry. The Jordi Resolve xStream column, unlike typical GPC columns, performs well in any range of mobile phases, including 100% aqueous, 100% organic or any mixture of solvents. This new column is optimized for use in aqueous-based mobile phases and has the unique ability to separate a variety of cationic and polar polymers. Dextrans, polysaccharides and vinyl ether/maleic acid copolymers prove to separate well on the Jordi Resolve xStream in pure water. Separations in THF include, but are not limited to, phenoxy resins, poly(n-butyl methacrylate), polycaprolactone, several styrenic polymers, PMMA and other methacrylic polymers. The Jordi Resolve xStream is also appropriate for analysis in HFIP, eliminating sample-column interactions and providing excellent resolution in the separation of nylons and PET. Other organic mobile phases applicable to separations on the Jordi Resolve xStream include chloroform, DMSO, DMAC and DMF.

Jordi Resolve Anion and Resolve Cation columns apply to the separation of charged polymers without the need for high salt concentrations. These columns are an excellent choice for light scattering analyses, where high salt concentrations compromise system performance. Jordi Anion columns have a negatively charged surface for the separation of anionic polymers, such as poly(styrene sulfonate). Typical solvents for this phase include aqueous/organic mixtures, such as water/methanol. Jordi Resolve Cation columns have a tertiary amine group, which in weakly acidic mobile phases converts to the positively charged quaternary amine. Common applications include the separation of amine polymers, such as poly(ethyleneimine) in water/acetic acid solutions. The ordering table contains the typical MW ranges for Jordi Resolve aqueous columns. The range is dependent on sample and mobile phase.

JORDI RESOLVE AQUEOUS GPC COLUMNS

PART NO	PHASE	POROSITY	PARTICLE SIZE	SIZE (mm)	PRESSURE	MW RANGE
R33061	xStream	500Å	5 µm	7.8 x 300	8,000 PSI	200 – 15K
R33066	xStream	Mixed Bed	5 µm	7.8 x 300	2,000 PSI	5K – 1M
R15701	Cation	500Å	5 µm	7.8 x 300	8,000 PSI	200 – 15K
R15706	Cation	Mixed Bed	5 µm	7.8 x 300	2,000 PSI	200 – 1M
R15721	Anion	500Å	5 µm	7.8 x 300	8,000 PSI	200 – 15K
R15726	Anion	Mixed Bed	5 µm	7.8 x 300	2,000 PSI	200 – 1M



- Monodisperse polymer particles
- 100% Divinylbenzene (DVB)
- Broad pore size range

Features

- No dislocations in pore distribution
- Clean light scattering background
- Highly symmetrical peaks
- Improved calibration
- Low back pressure
- Stable up to 220 °C
- Long column life
- Repeatability
- Plate count
- Resolution

Why Jordi Resolve Columns?

- Improved regularity
- Increased separation efficiency
- Highly linear calibration means increased accuracy
- Measures every MW between 500 and 12 million

What makes our new columns better?

- Monodisperse bead size
- Novel 100% DVB column packing
- Enhanced mechanical stability

For what industries are these columns best suited?

- Petroleum
- Chemical
- Consumer Product Goods

What are some common applications for Jordi Resolve Columns?

- High molecular weight polymers
- Polyethylene and Polypropylene at high temperature

Perkin Elmer Brownlee Columns

Aquapore® is a wide-pore (300Å, 7 µm), silica based support suitable for the separation of large biopolymers. Spheri-5® is a small pore (80Å, 5 µm), silica based sorbent for separating small molecules. Both monofunctional and polyfunctional C8 and C18 sorbents are available.

Polypore® packings are derivatized polystyrene divinylbenzene copolymer resins. The Polypore H cartridges are optimized for organic acid separations and the Polypore CA cartridges are for saccharide separations.

BROWNLEE NEWGUARD CARTRIDGE COLUMNS 3.2 mm ID x 1.5 cm			
PART NO	DESCRIPTION	TYPE	QTY
0711-0086	Aquapore Dimethyl, 7 µm	RP-2	3/pk
0711-0088	Aquapore Butyl, 7 µm	RP-4	3/pk
0711-0090	Aquapore Octyl, 7 µm	RP-8	3/pk
0711-0092	Aquapore ODS, 7 µm	RP-18	3/pk
0711-0096	Aquapore Phenyl, 7 µm	Phenyl	3/pk
0711-0098	Aquapore Amino, 7 µm	Amino	3/pk
0711-0100	Aquapore Cyano, 7 µm	Cyano	3/pk
0711-0102	Aquapore AX-300, 7 µm	Anion	3/pk
0711-0105	Aquapore Diol, 7 µm	Diol	3/pk
0711-0106	Aquapore Silica, 7 µm	Silica	3/pk
402-237	Validated C18, 5 µm	C18	3/pk
0715-0001	NewGuard™ Holder, Holds a single NewGuard cartridge for use with conventional HPLC columns		ea
0715-0018	Union for direct coupling of two cartridges (2 Holder bodies and 2 end assemblies also required)		ea

SPECIFICATIONS						
PRODUCT	FUNCTIONALITY	PORE SIZE	SURFACE AREA	% CARBON	END CAP	
Spheri-5, RP-8	Octyl (C8) monofunctional	80 Å	180 m2/g	6%	yes	
Spheri-5, RP-18	Octyl (C18) monofunctional	80 Å	180 m2/g	11%	yes	
Spheri-5, ODS	Octyl (C18) polyfunctional	80 Å	180 m2/g	14%	yes	
Spheri-5, Phenyl	Phenyl	80 Å	180 m2/g	6%	yes	
Spheri-5, Silica	Hydroxyl	80 Å	180 m2/g	N/A	N/A	
Spheri-5, Amino	Aminopropyl	80 Å	180 m2/g	3%	no	
Spheri-5, Cyano	Cyanopropyl	80 Å	180 m2/g	4%	no	
Aquapore ODS, OD-300	Octadecyl (C18)	300 Å	100 m2/g	10%	yes	
Aquapore Octyl, RP-300	Octyl (C8)	300 Å	100 m2/g	5%	yes	
Aquapore Butyl, BU-300	Butyl (C4)	300 Å	100 m2/g	3%	yes	
Aquapore weak anion, AX-300	Polyethyleneimine	300 Å	100 m2/g	N/A	N/A	
Polypore H	Hydrogen form	microporous				
Polypore CA	Calcium form	microporous				

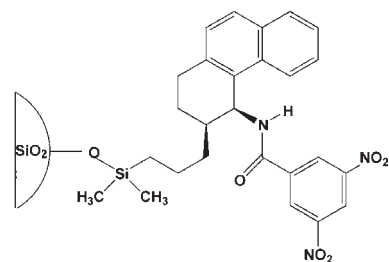
PERKIN ELMER BROWNLEE HPLC CARTRIDGE COLUMNS							
DESCRIPTION	3 CM CARTRIDGES (2/PK) REQUIRES HOLDER 0715-0013		10 CM CARTRIDGES REQUIRES HOLDER 0715-0014		22 CM CARTRIDGES REQUIRES HOLDER 0715-0015		
	4.6 mm ID	2.1 mm ID	4.6 mm ID	2.1 mm ID	4.6 mm ID	2.1 mm ID	
REVERSE PHASE	RP-8 Spheri-5, C-8, 5 µm, monofunctional	0711-0001	0711-0002	0711-0003	0711-0004	0711-0005	0711-0006
	RP-8 Spheri-10, C-8 10 µm, monofunctional	0711-0121	—	0711-0123	—	—	—
	Pecosphere 3CR, C8, 3 µm, base deactivated	0258-0191	—	—	—	—	—
	RP-18 Spheri-5, C-18 5 µm, monofunctional	0711-0013	0711-0014	0711-0015	0711-0016	0711-0017	0711-0018
	RP-18 Spheri-10, C-18 10 µm, monofunctional	0711-0115	—	0711-0117	—	0711-0119	—
	ODS Spheri-5, C-18 5 µm, polyfunctional	0711-0019	0711-0020	0711-0021	0711-0022	0711-0023	0711-0024
	Phenyl Spheri-5 5 µm	0711-0025	—	—	—	0711-0029	—
	Cyano Spheri-5, 5 µm, Cyanopropyl	0711-0043	—	0711-0045	—	0711-0047	—
	OD-300 Aquapore ODS, 7 µm, 300 Å pore size	0711-0235	0711-0234	0711-0232	0711-0233	0711-0231	0711-0236
	RP-300 Aquapore Octyl, 7 µm, 300 Å pore size	0711-0055	0711-0056	0711-0057	0711-0058	0711-0059	0711-0060
BU-300 Aquapore Butyl, 7 µm, 300 Å pore size	0711-0061	0711-0062	—	0711-0064	—	—	
POLAR PHASE	Silica Spheri-5, 5 µm, 80 Å pore size	0711-0031	—	0711-0033	—	0711-0035	—
	Silica Spheri-10 10 µm, 80 Å pore size	0711-0145	—	—	—	—	—
	Amino Spheri-5, 5 µm, Aminopropyl	0711-0037	—	0711-0039	—	0711-0041	—
	Cyano Spheri-5, Cyanopropyl	0711-0043	—	0711-0045	—	0711-0047	—
ION EXCHANGE	AX-300 Aquapore Weak Anion 300 Å, 7 µm	0711-0073	0711-0074	0711-0075	—	0711-0077	—
	Hydrogen form Polypore H, 10 µm	0711-0085	—	0711-0087	—	0711-0089	—
	Calcium form Polypore CA, 10µm	0711-0091	—	—	—	0711-0095	—
Holder	0715-0013		0715-0014		0715-0015		

Regis Pirkle Chiral HPLC Columns

Whelk-O® 1 | Analytical to Preparative Columns

The Whelk-O® 1 is useful for the separation of underivatized enantiomers in a number of families including amides, epoxides, esters, ureas, carbamates, ethers, aziridines, phosphonates, aldehydes, ketones, carboxylic acids, alcohols, and non-steroidal anti-inflammatory drugs (NSAIDs). This π -electron acceptor/ π -electron donor phase exhibits an extraordinary degree of generality. The broad versatility observed on the Whelk-O® 1 column compares favorably with polysaccharide-derived chiral stationary phases.

In addition, because Whelk-O® 1 is covalently bonded to the support, the phase is compatible with all commonly used mobile phases, including aqueous systems — a distinct advantage over polysaccharide derived chiral stationary phases. Other advantages include column durability, excellent efficiency, ability to invert elution order, and excellent preparative capacity.



SIZE (mm)	PARTICLE SIZE (μm)	(S,S)	(R,R)
4.6 x 250	16	786351	786361
50 x 500	10	786704	786710
50 x 250	10	786703	786709
30 x 500	10	786716	786713
30 x 250	10	786702	786708
21.1 x 500	10	786645	786545
21.1 x 250	10	786635	786535
21.1 x 150	10	786617	786518
10 x 250	10	786625	786525
4.6 x 300	10	—	786517
4.6 x 250	10	786615	786515
4.6 x 150	10	786251	786252
4.6 x 100	10	786908	786909
4.6 x 50	10	786906	786907
2.1 x 50	10	786902	786903

SIZE (mm)	PARTICLE SIZE (μm)	(S,S)	(R,R)
50 x 250	5	780104	780204
30 x 250	5	780103	780203
30 x 150	5	780108	780208
21.1 x 250	5	780107	780207
21.1 x 150	5	780109	780209
21.1 x 100	5	780110	—
10 x 250	5	780102	780202
4.6 x 250	5	780101	780201
4.6 x 150	5	780105	780205
4.6 x 100	5	780151	780251
4.6 x 50	5	780152	780252
4.6 x 30	5	780153	780253
2.1 x 150	5	780106	780206
2.1 x 100	5	780154	780254
2.1 x 50	5	780155	780255
2.1 x 30	5	780156	780256
4.6 x 250	3.5	780123	780223
4.6 x 150	3.5	780122	780222
4.6 x 100	3.5	780121	780221
4.6 x 50	3.5	780120	780220
3.0 x 150	3.5	780124	780224
3.0 x 100	3.5	780125	780225
3.0 x 50	3.5	780126	780226
3.0 x 20	3.5	780127	780227
2.1 x 150	3.5	780130	780230
2.1 x 100	3.5	780129	780229
2.1 x 50	3.5	780128	780228

Bulk packaging is available for 5 μm , 10 μm , and 16 μm material
 Bulk packaging and select sizes of 20 μm material are available with YMC silica
 Select sizes are also available with Exsil silica

RegisPack™ Columns

RegisPack™ polysaccharide coated chiral columns are made using a unique production process of coating the proven chiral selector tris-(3,5-dimethylphenyl) carbamoyl amylose on high purity silica gel. RegisPack™ columns are available in 3, 5, 10, and 20 micron particle sizes enabling easy scale up from analytical to preparative using HPLC or SFC conditions. Bulk material is available upon request.

SIZE (mm)	PARTICLE SIZE (µm)	PART NO
4.6 x 250	20	783304
50 x 250	10	783208
30 x 250	10	783207
21.1 x 250	10	783206
10 x 250	10	783205
4.6 x 250	10	783204
4.6 x 150	10	783203
4.6 x 100	10	783202
4.6 x 50	10	783201
2.1 x 150	10	783221
50 x 250	5	783108
30 x 250	5	783107
30 x 150	5	783109
21.1 x 250	5	783106
10 x 250	5	783105
4.6 x 250	5	783104
4.6 x 150	5	783103
4.6 x 100	5	783102
4.6 x 50	5	783101
2.1 x 150	5	783122

SIZE (mm)	PARTICLE SIZE (µm)	PART NO
4.6 x 250	3	783504
4.6 x 150	3	783503
4.6 x 100	3	783502
4.6 x 50	3	783507
3 x 150	3	783505
3 x 100	3	783506
3 x 50	3	783501
3 x 20	3	783508
2.1 x 150	3	783511
2.1 x 100	3	783510
2.1 x 50	3	783509

**Other Regis Phases Available****Regis Pirkle-Type Chiral HPLC Columns**

Whelk-O® 2
Leucine
Phenylglycine
Beta-GEM 1
Alpha-Burke 2
Pirkle 1-J
DACH-DNB
ULMO

Crown Ether Chiral Stationary Phases

ChiroSil® RCA (+)
ChiroSil® SCA (-)

Polysaccharide Coated Chiral Stationary Phases

RegisCell™
RegisPack™ CLA-1

Regis Immobilized Artificial Chromatography

Immobilized Artificial Membrane (IAM) technology is an innovative approach to chromatography in which the chromatographic surface emulates the lipid environment of the cell membrane.^{1,2}

HPLC Separation Tools for Membrane Protein Purification and Drug Membrane Permeability Prediction

Phosphatidylcholine (PC) is the major phospholipid found in cell membranes. IAM chromatography phases prepared from PC analogs closely mimic the surface of a biological cell membrane. Consequently, IAM phases display a high affinity for membrane proteins and are useful in membrane protein purification and in the study of drug membrane interactions. The IAM surface is formed by covalently bonding the membrane-forming phospholipids to silica. Several different types of IAM columns are used for various applications.

Regis IAM.PC

The IAM.PC phase, developed by Dr. Charles Pidgeon of Purdue University, was the first in a line of IAM phases to be manufactured by Regis. Use of this phase has simplified the inherent difficulties of protein isolation and purification,³⁻⁹ allowing for rapid purification of membrane proteins while maintaining biological activity. The IAM.PC phase is an important tool for the pharmaceutical industry and academia alike.

The first IAM stationary phase was based on the prevalent membrane lipid, phosphatidylcholine (PC), and consists of monolayers of amphiphilic phospholipids covalently bonded to aminopropyl silica particles through a terminal amide linkage. As a result, the bulky phosphatidylcholine groups shield many of the amine binding sites on the silica surface, preventing amine interaction with the protein molecules.

The membrane nature of the IAM phase imparts surface characteristics which are useful in the chromatography of membrane proteins. These include: high protein loading, increased protein recovery, recovery of functional activity, and selectivity for membrane proteins.

Large membrane proteins can interact with any combination of polar headgroup, hydrophobic chain, or inner amine groups. The subsurface has been shown to interact with certain solutes, and may or may not contribute to the separation of a given biomolecule. The residual amines can be left unaltered on the subsurface or deactivated through an endcapping procedure, which results in increased stability of the bonded phase. The methyl glycolate endcapping, for example, converts residual amines to neutral amides and introduces a hydroxyl group (IAM.PC.MG).

DESCRIPTION	PARTICLE SIZE	SIZE (mm x mm)	PART NO
IAM.PC	10 µm, 300Å	4.6 x 150	770001
IAM.PC	10 µm, 300Å	4.6 x 30	770007
IAM.PC Guard Kit*	10 µm, 300Å	3.0 x 10	771001
IAM.PC.Guard Replacement**	10 µm, 300Å	3.0 x 10	774001
IAM.PC.MG	10 µm, 300Å	4.6 x 150	772001
IAM.PC.MG	10 µm, 300Å	4.6 x 30	772007
IAM.PC.MG Guard Kit*	10 µm, 300Å	3.0 x 10	773001

* Includes 1 holder and 2 guard cartridges

** Includes 3 guard cartridges

Membrane Protein Purification

IAM.PC
IAM.PC.MG

Drug Discovery

IAM.PC.DD2

IAM Fast-Screen Mini Columns



APPLICATIONS

Purification of Cytochrome P450, Isolation of membrane proteins, Prediction of solute transport across human skin, Prediction of amino acid transport across the blood-brain barrier, Binding of solutes to liposome membranes, Immobilization of Trypsin and chymotrypsin for the determination of their inhibitor and substrate activity

Regis Immobilized Artificial Chromatography (cont.)

Regis IAM.PC.DD2 IAM Fast-Screen Mini Column

IAM chromatography has recently gained acceptance among drug discovery chemists for estimating the membrane permeability of small molecule drugs.

The figure to the right illustrates that the interaction between membrane bilayer and drug can be modeled by the IAM column/drug system.

K_{IAM} , the equilibrium constant describing the relative concentrations of drug in the membrane and in the external fluid, is analogous to the K_m .

This IAM technique provides superior correlation with experimentally determined drug permeability when compared to other chromatographic methods. ODS silica, for example, retains analytes solely on the basis of hydrophobicity. IAM more closely mimics the interaction of analytes with biological membranes, where a combination of hydrophobic, ion pairing, and hydrogen bonding interactions are possible. This combination of interactions measured by the IAM column is known as phospholipophilicity.

DESCRIPTION	PARTICLE SIZE	SIZE (mm x mm)	PART NO
IAM.PC.DD2	10 μ m, 300Å	4.6 x 150	774014
IAM.PC.DD2	10 μ m, 300Å	4.6 x 100	774011
IAM.PC.DD2	10 μ m, 300Å	4.6 x 30	774010
IAM.PC.DD2	10 μ m, 300Å	3.0 x 150	774003
IAM.PC.DD2 Guard Kit*	10 μ m, 300Å	3.0 x 10	774012
IAM.PC.DD2 Guard Replacement**	10 μ m, 300Å	3.0 x 10	774013

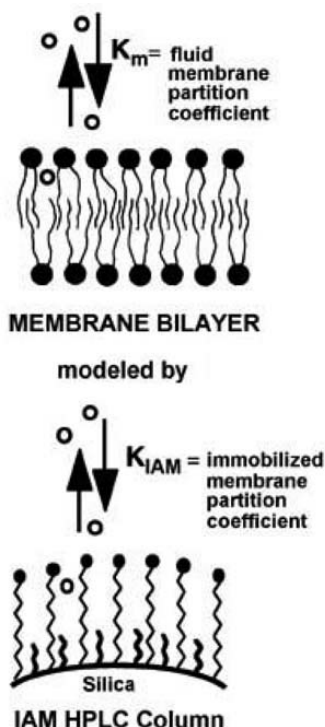
* Includes 1 holder and 2 guard cartridges

** Includes 3 guard cartridges

DESCRIPTION	PARTICLE SIZE	SIZE (mm x mm)	PART NO
IAM Fast-Screen Mini Column Kit (Includes: 2 columns, 1 cartridge holder, care & use booklet)	10 μ m, 300Å	3.0 x 10	775014
IAM Fast-Screen Mini Columns, 6/pk (Includes 6 columns, care & use booklet)	10 μ m, 300Å	3.0 x 10	775015
IAM Fast Screen Mini Columns, 12/pk (Includes 12 columns, care & use booklet)	10 μ m, 300Å	3.0 x 10	775016

IAM References

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- Pidgeon, C.; *Solid Phase Membrane Mimetics: Immobilized Artificial Membranes*; Enz. Microb. Technol. 1990, 12, 149–150.
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Fluid membrane bilayer can be modeled by IAM column.

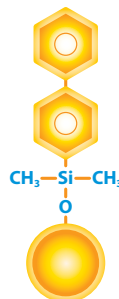
TECH TIP

Because the IAM Fast-Screen Mini Column is inexpensive, has a very short analysis time, and provides drug permeability estimates for hundreds of drug candidates in a fraction of the time of conventional methods, the IAM Fast-Screen Mini Column becomes the economical alternative for high throughput screening.

Restek Raptor™ Superficially Porous Core-Shell LC Columns

Biphenyl (USP L11)

- Ideal for bioanalytical applications like drug and metabolite analyses
- Heightened selectivity and retention for compounds that are hard to resolve or elute early on C18 and other phenyl chemistries
- Limits ionization suppression; allows MS-friendly mobile phases



ARC-18

- Ideal for high-throughput LC-MS/MS applications with minimal sample prep
- Well-balanced retention profile for better detection and integration of large, multiclass analyte lists
- Sterically protected to endure low-pH mobile phases without sacrificing retention or peak quality
- Part of Restek's Raptor™ LC column line featuring 2.7 and 5 μm SPP core-shell silica



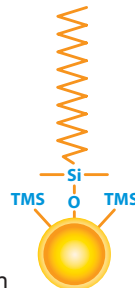
With Raptor™ LC columns, Restek chemists became the first to combine the speed of superficially porous particles (also known as SPP or "core-shell" particles) with the resolution of highly selective USLC® technology. This new breed of chromatographic column allows you to more easily achieve peak separation and faster analysis times without expensive UHPLC instrumentation.

The Raptor™ ARC-18 column features a well-balanced retention profile without the drawbacks of using an ordinary C18 in the harsh, acidic mobile phases needed for mass spectrometry (MS). Even after extended use in these low-pH (≤ 2.0) conditions, the sterically protected ARC-18 offers consistent retention, peak shape, and response for charged bases, neutral acids, small polar compounds, and more.

For the rapid analysis of large, multiclass assays by LC-MS/MS, the acid-resistant Raptor™ ARC-18 truly is ahead of the curve.

C18 (USP L1)

- Compatible with moderately acidic to neutral mobile phases (pH 2 – 8)
- Excellent data quality in food, environmental, bioanalytical, and other applications
- General purpose column for reversed phase chromatography
- Increased retention of hydrophobic compounds



When you need a general-purpose LC column, don't just grab any C18. Choose the speed, efficiency, and long-lasting ruggedness of the Raptor™ C18. This traditional end-capped C18 offers the highest hydrophobic retention of any Raptor™ phase, and it is compatible with a wide range of mobile phases from moderately acidic to neutral (pH 2–8). Whether for food safety or environmental or bioanalytical analyses, this phase offers consistently excellent data quality in less time across a myriad of reversed-phase applications, matrices, and compound classes. To lower costs and improve profitability, you need columns to last longer, data to be reproducible, and existing HPLC instrumentation to run faster—get there with the Raptor™ C18.



Restek Raptor™ Superficially Porous Core-Shell LC Columns (cont.)

RESTEK RAPTOR SPECIFICATIONS			
	BIPHENYL	ARC-18	C18
Phase	Phenyl (L11)	C18, octadecylsilane (L1)	C18, octadecylsilane (L1)
Ligand type	Biphenyl	Sterically protected C18	End-capped C18
Pore size	90 Å	90 Å	90 Å
Max temp	80° C	80° C	80° C
pH range	1.5 – 8.0	1.0 – 8.0	2.0 – 8.0
Particle	2.7 µm or 5 µm superficially porous silica (SPP or "core-shell")	2.7 µm or 5 µm superficially porous silica (SPP or "core-shell")	2.7 µm or 5 µm superficially porous silica (SPP or "core-shell")
Surface area	150 m2/g (2.7 µm) 100 m2/g (5 µm)	150 m2/g (2.7 µm) 100 m2/g (5 µm)	150 m2/g (2.7 µm) 100 m2/g (5 µm)
Max pressure	600 bar / 8,700 PSI (2.7 µm) 400 bar / 5,800 PSI (5 µm)	600 bar / 8,700 PSI (2.7 µm) 400 bar / 5,800 PSI (5 µm)	600 bar / 8,700 PSI (2.7 µm) 400 bar / 5,800 PSI (5 µm)

SIZE (mm)	PARTICLE SIZE (µm)	BIPHENYL	ARC-18	C18
4.6 x 250	5	RTK-9309575	RTK-9314575	RTK-9304575
4.6 x 150	5	RTK-9309565	RTK-9314565	RTK-9304565
4.6 x 100	5	RTK-9309515	RTK-9314515	RTK-9304515
4.6 x 50	5	RTK-9309555	RTK-9314555	RTK-9304555
4.6 x 5 Guard, 3/pk		RTK-930950250	RTK-931450250	RTK-930450250
3.0 x 150	5	RTK-930956E	RTK-931456E	RTK-930456E
3.0 x 100	5	RTK-930951E	RTK-931451E	RTK-930451E
3.0 x 50	5	RTK-930955E	RTK-931455E	RTK-930455E
3.0 x 30	5	RTK-930953E	RTK-931453E	RTK-930453E
3.0 x 5 Guard, 3/pk		RTK-930950253	RTK-931450253	RTK-930450253
2.1 x 150	5	RTK-9309562	RTK-9314562	RTK-9304562
2.1 x 100	5	RTK-9309512	RTK-9314512	RTK-9304512
2.1 x 50	5	RTK-9309552	RTK-9314552	RTK-9304552
2.1 x 5 Guard, 3/pk		RTK-930950252	RTK-931450252	RTK-930450252
4.6 x 150	2.7	RTK-9309A65	RTK-9314A65	RTK-9304A65
4.6 x 100	2.7	RTK-9309A15	RTK-9314A15	RTK-9304A15
4.6 x 50	2.7	RTK-9309A55	RTK-9314A55	RTK-9304A55
4.6 x 30	2.7	RTK-9309A35	RTK-9314A35	RTK-9304A35
4.6 x 5 Guard, 3/pk		RTK-9309A0250	RTK-9314A0250	RTK-9304A0250
3.0 x 150	2.7	RTK-9309A6E	RTK-9314A6E	RTK-9304A6E
3.0 x 100	2.7	RTK-9309A1E	RTK-9314A1E	RTK-9304A1E
3.0 x 30	2.7	RTK-9309A3E	RTK-9314A3E	RTK-9304A3E
3.0 x 50	2.7	RTK-9309A5E	RTK-9314A5E	RTK-9304A5E
3.0 x 5 Guard, 3/pk		RTK-9309A0253	RTK-9314A0253	RTK-9304A0253
2.1 x 150	2.7	RTK-9309A62	RTK-9314A62	RTK-9304A62
2.1 x 100	2.7	RTK-9309A12	RTK-9314A12	RTK-9304A12
2.1 x 50	2.7	RTK-9309A52	RTK-9314A52	RTK-9304A52
2.1 x 30	2.7	RTK-9309A32	RTK-9314A32	RTK-9304A32
2.1 x 5 Guard, 3/pk		RTK-9309A0252	RTK-9314A0252	RTK-9304A0252

Raptor™ EXP® Guard Column Cartridges

- ➔ Free-Turn® architecture lets you change cartridges by hand without breaking inlet/outlet fluid connections—no tools needed
- ➔ Guard column cartridges require EXP direct connect holder



CHROM TECH RELATED PRODUCTS



15-24-03832
EXP Repl Ferrule



15-20-03930
EXP Nut & Ferrule
Hand-tight to 8,700 PSI
Wrench-tight to 20,000 PSI

Restek Raptor Chromatograms

Get Complete Isobaric Resolution and Sub-5-minute Pain Panel Runs

Column: Raptor™ Biphenyl
RTK-9309A5E
3.0 x 50 mm, 2.7 μm

Instrumentation: API LC-MS/MS

Detector: AB SCIEX API4000™ MS/MS; ESI+

Mobile Phase: A: 0.1% formic acid in H₂O
B: 0.1% formic acid in methanol

Gradient: 10% B, 0.00 min; 45% B, 1.50 min;
100% B, 2.50 min; 100% B, 3.70 min;
10% B, 3.71 min; 10% B, 5.00 min

Temp: 30 °C

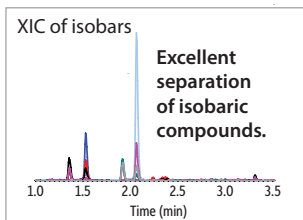
Flow Rate: 0.6 mL/min

Sample: Diluent: urine:mobile phase A:
mobile phase B (17:76:7)

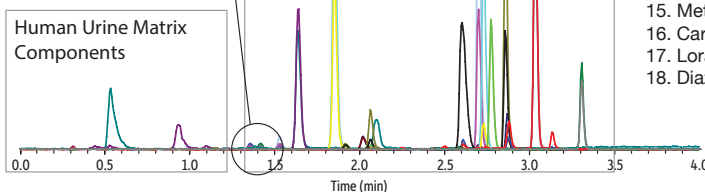
Injection: 10 μL.

Concentration: 10 – 100 ng/mL

Lorazepam was prepared at 100 ng/mL;
all other analytes are 10 ng/mL



Analyses separated from early-eluting matrix.



1. Morphine
2. Oxycodone
3. Hydromorphone
4. Amphetamine
5. Methamphetamine
6. Codeine
7. Oxycodone
8. Hydrocodone
9. Norbuprenorphine
10. Meprobamate
11. Fentanyl
12. Buprenorphine
13. Flurazepam
14. Sufentanil
15. Methadone
16. Carisoprodol
17. Lorazepam
18. Diazepam

Analysis of Vitamin D and Metabolites with Raptor ARC-18

Column: Raptor™ ARC-18
RTK-9314A12
2.1 x 100 mm, 2.7 μm

Instrumentation: Shimadzu UFLCXR

Detector: AB SCIEX API4000™; Ion Source:
TurbolonSpray®; Ion Mode: ESI+

Mobile Phase: A: 0.1% formic acid + 5 mM ammonium
formate in water
B: 0.1% formic acid + 5 mM ammonium
formate in methanol

Gradient (%B): 0.00 min (90%), 4.00 min (100%),
4.01 min (90%), 6.00 (90%)

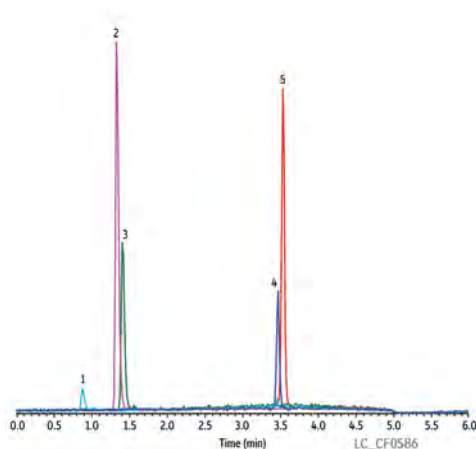
Temp: 40 °C

Flow Rate: 0.5 mL/min

Sample: Diluent: Methanol

Injection: 5 μL.

Concentration: 200 ng/mL



1. 1,25-Dihydroxyvitamin D3
2. 25-Hydroxyvitamin D3
3. 25-Hydroxyvitamin D2
4. Vitamin D2
5. Vitamin D3

Separating fat-soluble vitamins by LC can be time consuming. The Raptor ARC-18 column, however, can analyze these difficult compounds using reversed-phase chromatography (RPC) in less time than traditional columns to increase productivity. Plus in the bioanalytical arena, the ARC-18 can quantitate the metabolites of vitamin D using the same column and mobile phases.

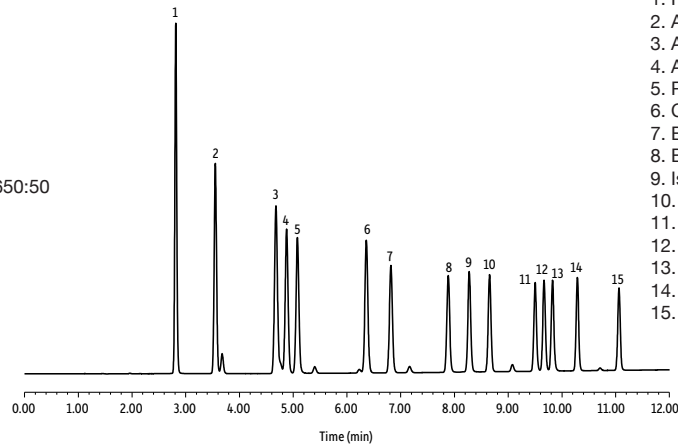
Aldehyde-Ketone-DNPH TO-A Calibration Mix on Raptor C18

Column A: Raptor C18
RTK-9304A65
150 mm x 4.6 mm ID

Mobile Phase: A: Water
B: Methanol: acetonitrile (650:50)

Temperature: 30 °C

Detector: UV/Vis @ 365, 4.8 nm



1. Formaldehyde
2. Acetaldehyde
3. Acrolein
4. Acetone
5. Propionaldehyde
6. Crotonaldehyde
7. Butyraldehyde
8. Benzaldehyde
9. Isovaleraldehyde
10. Valeraldehyde
11. *o*-Tolualdehyde
12. *m*-Tolualdehyde
13. *p*-Tolualdehyde
14. Hexanal
15. 2,5-Dimethylbenzaldehyde

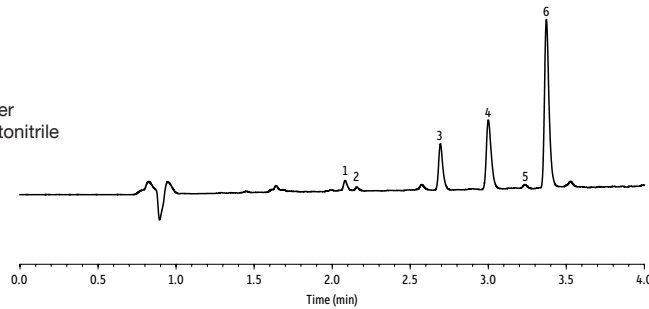
Cannabis Potency by LC--Cannabis Sample 71 on Raptor ARC-18

Column A: Raptor ARC-18
RTK-9314A65
150 mm x 4.6 mm ID

Mobile Phase: 0.1% Formic acid in water
0.1% Formic acid in acetonitrile

Temperature: 50 °C

Detector: UV @ 220 nm



1. Cannabidiolic acid
2. Cannabigerol
3. Cannabinol
4. delta-9-Tetrahydrocannabinol
5. Cannabichromene
6. delta-9-Tetrahydrocannabinolic acid A

Cannabis Potency by LC--Cannabis Sample 71 on Raptor ARC-18

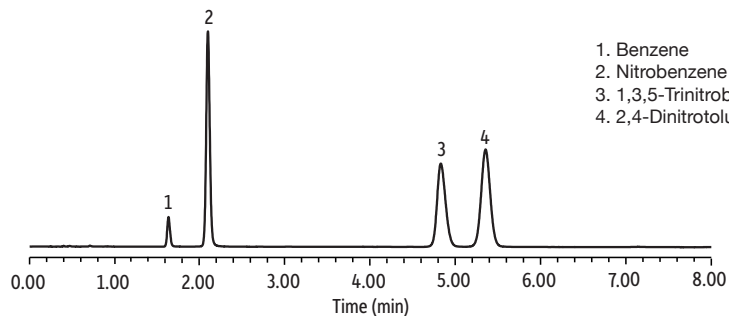
Column A: Raptor Biphenyl
RTK-9309A55
50 mm x 4.6 mm ID

Mobile Phase: Water:Methanol (50:50)

Flow: 1.2 mL/min

Temperature: 40 °C

Detector: Waters Acquity® PDA @ 254 nm



1. Benzene
2. Nitrobenzene
3. 1,3,5-Trinitrobenzene
4. 2,4-Dinitrotoluene

Restek Ultra HPLC Columns

RESTEK LC ANALYTICAL COLUMN SPECIFICATIONS

	ULTRA AQUEOUS C18	ULTRA IBD	ULTRA BIPHENYL	ULTRA PFP PROPYL	ULTRA C18
Particle size:	3 µm or 5 µm, spherical	3 µm or 5 µm, spherical	3 µm or 5 µm, spherical	3 µm or 5 µm, spherical	3 µm or 5 µm, spherical
Pore size:	100 Å	100 Å	100 Å	100 Å	100 Å
Carbon load:	15%	12%	15%	11%	20%
End-cap:	no	no	yes	yes	yes
pH range:	2.5 to 8	2.5 to 8	2.5 to 8	2.5 to 8	2.5 to 8
Temperature limit:	80 °C	80 °C	80 °C	80 °C	80 °C
USP phase code:	L1	L68	L11	L43	L1
Phase category:	modified C18	polar-embedded alkyl	phenyl	fluorophenyl propyl	C18, octadecylsilane
Ligand type:	proprietary polar modified and functionally bonded C18	proprietary polar functional embedded alkyl	unique Biphenyl	pentafluorophenyl propyl	monomeric C18

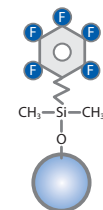
Ultra Aqueous C18 (USP L1)

The Restek® Aqueous C18 is a rugged, reversed-phase column with a well-balanced retention profile. It can effectively retain more types of solutes than a conventional C18 and is ideal for multicomponent LC-MS analyses. The general-purpose Aqueous C18 boasts high reproducibility and compatibility with many mobile phase conditions—even 100% aqueous. And when used with a gradient, it eliminates the all-too-common issue of multiple compounds eluting near the column void time.



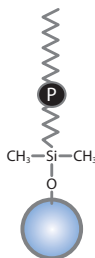
Ultra PFP Propyl (USP L43)

The Restek® PFP Propyl is a great choice for the retention and selectivity of charged bases, electronegative compounds, and amine-containing compounds. Unlike a conventional cyano column, the Restek® PFP Propyl is much more amenable to LC-MS because it is more reliable and efficient with acidic mobile phases. This versatile column is also compatible with highly aqueous mobile phases and HILIC separations.



Ultra IBD (USP L68)

The Restek® IBD is a polar-embedded column that acts as a strong hydrogen bond donor and may be the most versatile column available today. With a unique polar group, this column is very retentive and selective for acids. It also provides symmetrical peak shape for strong bases. Restek's IBD is compatible with 100% aqueous mobile phases and can be used under reversed-phase or HILIC conditions to retain very polar, ionic compounds in highly organic mobile phases.

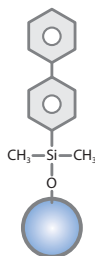


Ultra C18 (USP L1)

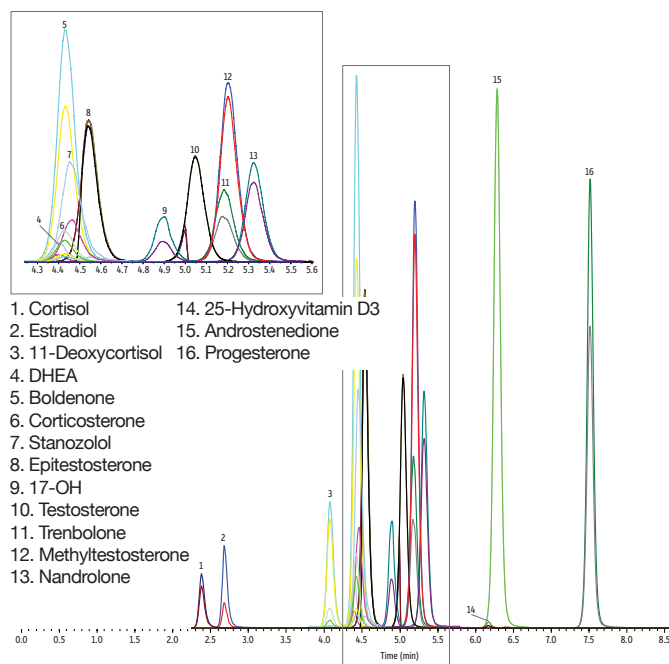
The general-purpose Restek® C18 is a conventional monomeric octadecylsilane column suitable for analyses of a wide range of compounds from acidic through slightly basic.

Ultra Biphenyl (USP L11)

Since 2005, the Restek® Biphenyl has offered a greater degree of dispersion than conventional phenyls and a greater degree of polarizability than phenyl hexyls, creating higher selectivity and a greater range of usability. Because of these heightened interactions, this column shows substantial increases in retention—especially for dipolar, unsaturated, or conjugated solutes—and enhanced orthogonal selectivity when using methanol mobile phases. It is ideal for increasing sensitivity and selectivity in LC-MS analyses.



Steroid Panel Analysis on the Ultra Biphenyl



Restek Ultra HPLC Columns (cont.)

SIZE (mm)	PARTICLE SIZE (µm)	ULTRA AQUEOUS C18	ULTRA IBD	ULTRA BIPHENYL	ULTRA PFP PROPYL	ULTRA C18
4.6 x 250	5	RTK-9178575	RTK-9175575	RTK-9109575	RTK-9179575	RTK-9174575
4.6 x 150	5	RTK-9178565	RTK-9175565	RTK-9109565	RTK-9176565	RTK-9174565
4.6 x 100	5	RTK-9178515	RTK-9175515	RTK-9109515	RTK-9179515	RTK-9174515
4.6 x 50	5	RTK-9178555	RTK-9175555	RTK-9109555	RTK-9179555	RTK-9174555
4.6 x 30	5	RTK-9178535	RTK-9175535	RTK-9109535	RTK-9179535	RTK-9174535
3.0 x 250	5	RTK-917857E	RTK-917557E	RTK-910957E	RTK-917957E	RTK-917457E
3.0 x 150	5	RTK-917856E	RTK-917556E	RTK-910956E	RTK-917956E	RTK-917456E
3.0 x 100	5	RTK-917851E	RTK-917551E	RTK-910951E	RTK-917951E	RTK-917451E
3.0 x 50	5	RTK-917855E	RTK-917555E	RTK-910955E	RTK-917955E	RTK-917455E
3.0 x 30	5	RTK-917853E	RTK-917553E	RTK-910953E	RTK-917953E	RTK-917453E
2.1 x 250	5	RTK-9178572	RTK-9175572	RTK-9109572	RTK-9179572	RTK-9174572
2.1 x 150	5	RTK-9178562	RTK-9175562	RTK-9109562	RTK-9179562	RTK-9174562
2.1 x 100	5	RTK-9178512	RTK-9175512	RTK-9109512	RTK-9179512	RTK-9174512
2.1 x 50	5	RTK-9178552	RTK-9175552	RTK-9109552	RTK-9179552	RTK-9174552
2.1 x 30	5	RTK-9178532	RTK-9175532	RTK-9109532	RTK-9179532	RTK-9174532
1.0 x 250	5	RTK-9178571	RTK-9175571	RTK-9109571	RTK-9179571	RTK-9174571
1.0 x 150	5	RTK-9178561	RTK-9175561	RTK-9109561	RTK-9179561	RTK-9174561
1.0 x 100	5	RTK-9178511	RTK-9175511	RTK-9109511	RTK-9179511	RTK-9174511
1.0 x 50	5	RTK-9178551	RTK-9175551	RTK-9109551	RTK-9179551	RTK-9174551
1.0 x 30	5	RTK-9178531	RTK-9175531	RTK-9109531	RTK-9179531	RTK-9174531
4.6 x 150	3	RTK-9178365	RTK-9175365	RTK-9109365	RTK-9179365	RTK-9174365
4.6 x 100	3	RTK-9178315	RTK-9175315	RTK-9109315	RTK-9179315	RTK-9174315
4.6 x 50	3	RTK-9178355	RTK-9175355	RTK-9109355	RTK-9179355	RTK-9174355
4.6 x 30	3	RTK-9178335	RTK-9175335	RTK-9109335	RTK-9179335	RTK-9174335
3.0 x 150	3	RTK-917836E	RTK-917536E	RTK-910936E	RTK-917936E	RTK-917436E
3.0 x 100	3	RTK-917831E	RTK-917531E	RTK-910931E	RTK-917931E	RTK-917431E
3.0 x 50	3	RTK-917835E	RTK-917535E	RTK-910935E	RTK-917935E	RTK-917435E
3.0 x 30	3	RTK-917833E	RTK-917533E	RTK-910933E	RTK-917933E	RTK-917433E
2.1 x 150	3	RTK-9178362	RTK-9175362	RTK-9109362	RTK-9179362	RTK-9174362
2.1 x 100	3	RTK-9178312	RTK-9175312	RTK-9109312	RTK-9179312	RTK-9174312
2.1 x 50	3	RTK-9178352	RTK-9175352	RTK-9109352	RTK-9179352	RTK-9174352
2.1 x 30	3	RTK-9178332	RTK-9175332	RTK-9109332	RTK-9179332	RTK-9174332
1.0 x 150	3	RTK-9178361	RTK-9175361	RTK-9109361	RTK-9179361	RTK-9174361
1.0 x 100	3	RTK-9178311	RTK-9175311	RTK-9109311	RTK-9179311	RTK-9174311
1.0 x 50	3	RTK-9178351	RTK-9175351	RTK-9109351	RTK-9179351	RTK-9174351
1.0 x 30	3	RTK-9178331	RTK-9175331	RTK-9109331	RTK-9179331	RTK-9174331



CHROM TECH RELATED PRODUCTS

15-24-03832
EXP Repl Ferrule



15-20-03930
EXP Nut & Ferrule
Hand-tight to 8,700 PSI
Wrench-tight to 20,000 PSI

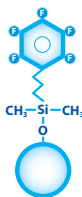


RTK-24995
UltraShield UHPLC
precolumn filter, 0.5 µm

Restek Force HPLC Columns

Force FluoroPhenyl (USP L43)

- Capable of both reversed-phase and HILIC separations
- Ideal for increasing sensitivity and selectivity in LC-MS analyses
- Offers increased retention for charged bases



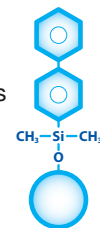
Force C18 (USP L1)

- A traditional end-capped C18 ideal for general-purpose use in reversed-phase chromatography
- Wide pH range (2–8) provides excellent data quality for many applications, matrices, and compounds
- Offers high hydrophobic retention



Force Biphenyl (USP L11)

- Ideal for bioanalytical testing applications like drug and metabolite analyses
- Heightened selectivity and retention for compounds that are hard to resolve or elute early on C18 and other phenyl chemistries
- Limits ionization suppression and allows simple, MS-friendly mobile phases
- Restek's most popular LC stationary phase



SIZE (mm)	PARTICLE SIZE (µm)	BIPHENYL	C18	FLUOROPHENYL
4.6 x 250	5	RTK-9629575	—	—
4.6 x 150	5	RTK-9629565	RTK-9634565	RTK-9639565
4.6 x 100	5	RTK-9629515	RTK-9634515	RTK-9639515
4.6 x 50	5	—	RTK-9634575	RTK-9639575
3 x 150	5	RTK-962956E	RTK-963456E	RTK-963956E
3 x 100	5	RTK-962951E	RTK-963451E	RTK-963951E
3 x 50	5	RTK-962955E	RTK-963455E	RTK-963955E
2.1 x 150	5	RTK-9629562	RTK-9634562	RTK-9639562
2.1 x 100	5	RTK-9629512	RTK-9634512	RTK-9639512
2.1 x 50	5	RTK-9629552	RTK-9634552	RTK-9639552
4.6 x 150	3	RTK-9629365	RTK-9634365	RTK-9639365
4.6 x 100	3	RTK-9629315	RTK-9634315	RTK-9639315
4.6 x 5 Guard, 3/pk		RTK-962950250	RTK-963450250	RTK-963950250
3 x 150	3	RTK-962936E	RTK-963436E	RTK-963936E
3 x 100	3	RTK-962931E	RTK-963431E	RTK-963931E
3 x 50	3	RTK-962935E	RTK-963435E	RTK-963935E
3 x 5 Guard, 3/pk		RTK-962950253	RTK-963450253	RTK-963950253
2.1 x 150	3	RTK-9629362	RTK-9634362	RTK-9639362
2.1 x 100	3	RTK-9629312	RTK-9634312	RTK-9639312
2.1 x 50	3	RTK-9629352	RTK-9634352	RTK-9639352
2.1 x 30	3	RTK-9629332	RTK-9634332	RTK-9639332
2.1 x 5 Guard, 3/pk		RTK-962950252	RTK-963450252	RTK-963950252
3 x 100	1.8	RTK-962921E	RTK-963421E	RTK-963921E
3 x 50	1.8	RTK-962925E	RTK-963425E	RTK-963925E
2.1 x 100	1.8	RTK-9629212	RTK-9634212	RTK-9639212
2.1 x 50	1.8	RTK-9629252	RTK-9634252	RTK-9639252
2.1 x 30	1.8	RTK-9629232	RTK-9634232	RTK-9639232

ULTRASHIELD UHPLC PRECOLUMN FILTERS

PART NO	PORE SIZE	QTY
RTK-24995	0.5 µm	ea
RTK-24996	0.5 µm	5/pk
RTK-24997	0.5 µm	10/pk
RTK-25809	0.2 µm	ea
RTK-25810	0.2 µm	5/pk
RTK-25811	0.2 µm	10/pk



RTK-24995



CHROM TECH RELATED PRODUCTS



15-24-03832
EXP Repl Ferrule

15-20-03930
EXP Nut & Ferrule
Hand-tight to 8,700 PSI
Wrench-tight to 20,000 PSI

Restek Roc® HPLC Columns

- ➔ Conventional HPLC column built to be the cornerstone for your lab; pressure rated for any 400 bar HPLC system
- ➔ Solid and reliable—delivers the peak shape, reproducibility, ruggedness, and performance you demand
- ➔ Exceptional value for routine analyses and large-volume workflows—high-purity, fully porous silica backed by quality manufacturing features a variety of phases to fit most HPLC methods
- ➔ Ideal for a wide range of applications from food to pharma

Solid, reliable Roc HPLC columns are pressure rated for any 400 bar HPLC system and deliver the peak shape, reproducibility, ruggedness, and performance you demand for all of your conventional HPLC applications, especially USP and other compendial methods. An exceptional value for routine analyses and large-volume workflows, Roc columns are made from high-purity, fully porous silica backed by quality manufacturing and are available in a variety of phases. Just 5 phases cover 98% of USP methods. Newly designed minimal packaging offers compact storage with serial #-specific certificates of analysis available upon request.



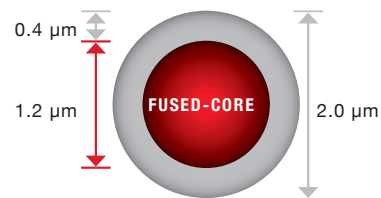
	C18	C8	PHENYL-HEXYL	CYANO	SILICA
USP Phase Code	L1	L7	L11	L10	L3
Stationary Phase Category	C18, octadecylsilane	C8, octylsilane	phenyl	cyano	bare silica
Ligand Type	monomeric C18	monomeric C8	phenyl-hexyl	cyanopropyl	n/a
Particle Size	3 µm or 5 µm, spherical	3 µm or 5 µm, spherical	3 µm or 5 µm, spherical	3 µm or 5 µm, spherical	3 µm or 5 µm, spherical
Pore Size	100 Å	100 Å	100 Å	100 Å	100 Å
Surface Area	300 m ² /g	300 m ² /g	300 m ² /g	300 m ² /g	300 m ² /g
Carbon Load	20%	12%	15%	8%	n/a
End-Cap	yes	yes	yes	yes	n/a
pH Range	2.5 to 8.0	2.5 to 8.0	2.0 to 8.0	2.5 to 8.0	2.5 to 8.0
Max Temperature	80 °C	80 °C	80 °C	80 °C	80 °C

SIZE (mm)	PARTICLE SIZE (µm)	ROC C18	ROC C8	ROC PHENYL HEXYL	ROC CN	ROC SILICA
4.6 x 250	5	RTK-9534575	RTK-9533575	RTK-9535575	RTK-9536575	RTK-9530575
4.6 x 150	5	RTK-9534565	RTK-9533565	RTK-9535565	RTK-9536565	RTK-9530565
4.6 x 100	5	RTK-9534515	RTK-9533515	RTK-9535515	RTK-9536515	RTK-9530515
3.0 x 250	5	RTK-953457E	RTK-953357E	RTK-953557E	RTK-953657E	RTK-953057E
3.0 x 150	5	RTK-953456E	RTK-953356E	RTK-953556E	RTK-953656E	RTK-953056E
3.0 x 100	5	RTK-953451E	RTK-953351E	RTK-953551E	RTK-953651E	RTK-953051E
4.6 x 150	3	RTK-9534365	RTK-9533365	RTK-9535365	RTK-9536365	RTK-9530365
4.6 x 100	3	RTK-9534315	RTK-9533315	RTK-9535315	RTK-9536315	RTK-9530315
3.0 x 150	3	RTK-953436E	RTK-953336E	RTK-953536E	RTK-953636E	RTK-953036E
3.0 x 100	3	RTK-953431E	RTK-953331E	RTK-953531E	RTK-953631E	RTK-953031E
Guard Cartridge, 3/pk		RTK-953450210	RTK-953350210	RTK-953550210	RTK-953650210	RTK-953050210
Guard Holder		RTK-25812	RTK-25812	RTK-25812	RTK-25812	RTK-25812

Millipore Sigma Ascentis Express

- ➔ Outperforms other smaller sub-2 μm particles in efficiency and addresses other disadvantages inherent in smaller sub-2 micron UHPLC columns.
- ➔ Delivers perfect balance of pressure and performance ideal for faster small molecule analysis on any UHPLC system.
- ➔ Available in C18, F5, OH5, and HILIC 5i phases.

With the addition of 2.0 μm Ascentis Express UHPLC columns, we now offer three U/HPLC Fused Core[®] particle columns, making the Ascentis Express column line truly scalable from UHPLC to legacy HPLC systems.



ASCENTIS EXPRESS SPECIFICATIONS

PORE SIZE	PRESSURE	TEMP LIMIT	pH RANGE	END-CAPPED
90 Å	14,500 PSI	60° C	2 – 9	Yes

Ascentis Express F5

The F5 pentafluorophenylpropyl stationary phase provides a stable reversed phase packing with electron-deficient phenyl rings due to the presence of electronegative fluorines. In addition to forming pi-pi and mildly steric interactions, F5 phases also retain compounds by polar interactions.

Ascentis Express F5 can be used for basic, acidic, or neutral compounds with alternate selectivity from C18.

Ascentis Express OH5

The OH5 stationary phase is a highly polar ligand that possesses 5 hydroxyl groups tethered to the silica via novel proprietary linkage chemistry. The high performance material provides a UHPLC column that can be used for traditional normal phase separations using non-polar, totally organic mobile phases or for aqueous normal phase chromatography with the typical mobile phases for hydrophilic interactive liquid chromatography (HILIC) or basic, acidic, zwitterionic, or neutral compounds.

Ascentis Express HILIC

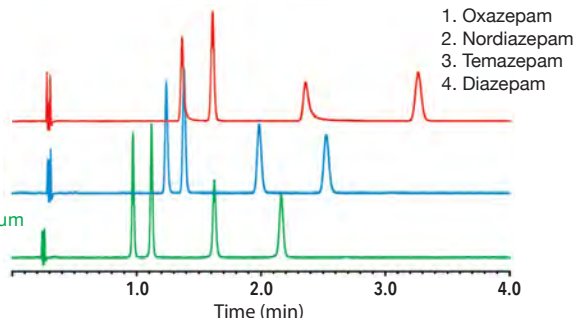
The Ascentis Express HILIC or bare silica stationary phase provides a UHPLC column that can be used for traditional normal phase separations using non-polar, totally organic mobile phases or for aqueous normal phase chromatography with the typical reversed-phase mobile phases for hydrophilic interactive liquid chromatography (HILIC) of basic, acidic, or neutral compounds.

Ascentis Express 2.0 μm Delivers Excellent Peak Shape and Efficiency with Speed Compared to Fully Porous Particle Columns

Porous C18, 1.8 μm
20765 plates peak 4
USP tailing factor peak 3 = 1.88 12200 PSI

Porous C18, 1.7 μm
16827 plates peak 4
USP tailing factor peak 3 = 1.11 14320 PSI

Ascentis Express C18, 2.0 μm
21786 plates peak 4
USP tailing factor peak 3 = 1.04 12720 PSI



Column: Ascentis Express C18 50813-U
2.1 x 100 mm, 2.0 μm

Temp: 35 °C

Detection: UV, 240 nm

Injection: 0.5 μL

Sample: 50 $\mu\text{g/mL}$ in 80:20, water:methanol

Instrument: Dionex Ultimate 3,000

Mobile Phase: A: H₂O w/0.1% formic acid
B: ACN w/0.1% formic acid, (65:35, A:B)

Flow Rate: 0.8 mL/min

SIZE (mm)	C18	F5	OH5	HILIC 5i
2.1 x 150	50814-U	50867-U	50962-U	51418-U
2.1 x 100	50813-U	50863-U	50959-U	51409-U
2.1 x 75	50812-U	50861-U	50958-U	51408-U
2.1 x 50	50811-U	50859-U	50957-U	51406-U
2.1 x 30	50809-U	50858-U	50952-U	51404-U
2.1 x 20	50805-U	50857-U	50951-U	51403-U
2.1 x 5 Guard Cartridge*, 3/pk	50822-U	50884-U	50969-U	51430-U
3.0 x 150	50821-U	50881-U	50968-U	51429-U
3.0 x 100	50819-U	50879-U	50967-U	51428-U
3.0 x 75	50817-U	50876-U	50965-U	51424-U
3.0 x 50	50816-U	50871-U	50964-U	51421-U
3.0 x 30	50815-U	50869-U	50963-U	51419-U
3.0 x 5 Guard Cartridge*, 3/pk	50823-U	50886-U	50973-U	51433-U
Universal EXP Guard Holder, ea	53500-U	53500-U	53500-U	53500-U

*Requires Universal EXP Guard Holder

Millipore Sigma Chromolith® RP-18 endcapped

- ➔ High throughput at high flow rates
- ➔ Possibility of flow gradients
- ➔ Improved security, robustness, reliability and versatility
- ➔ Column length no longer pressure limited
- ➔ Cost savings due to increased sample throughput
- ➔ Added performance by column coupling
- ➔ Significantly longer column lifetime
- ➔ Relief from back pressure

Chromolith® monolithic HPLC columns combine speed and efficiency like never before. Chromolith® column consists of a single rod of high-purity polymeric silica gel with a bimodal pore structure of macro and mesopores. The macropores (average size 2 µm) reduce column back pressure, allowing significantly faster flow rates. The mesopores form a fine porous structure (average pore size 13 nm), which creates a very large active surface area for high-efficiency separations. For even greater efficiency, multiple Chromolith® columns can be coupled to achieve a higher theoretical plate count with still very low back pressure.

Cladded Chromolith® columns in PEEK are very easy to use and handle—ideally suited for use with all standard HPLC instruments



TECH TIP

Classic Particulate Columns VS Chromolith® HPLC Columns

The use of HPLC columns containing the classic 3 or 5 µm small silica particles often results in high back pressure. This may damage both the column and the HPLC system; therefore, classic HPLC columns have limited length and a limited number of theoretical plates. Attempts have been made to increase the plate count by decreasing the particle size, but this results in unacceptable back pressure and limits the variety of separations that can be satisfactorily achieved.

Thanks to their revolutionary bimodal pore structure, Chromolith® columns provide excellent separations in a fraction of the time that a standard particulate column takes. This enables higher speeds and higher sample throughput at lower back pressure.

Validation Kit

The Chromolith® validation kit includes three columns from three different production batches, allowing you to easily compare batch-to-batch reproducibility and quality. This makes the validation kit an ideal tool for quality control and validation laboratories.

MILLIPORE SIGMA CHROMOLITH® RP-18 ENDCAPPED

PART NO	SIZE (mm)	MACROPORE SIZE	QTY
1021290001	4.6 x 100	2 µm	ea
1514660001	4.6 x 100	2 µm	3/pk Validation Kit
1514500001	4.6 x 50	2 µm	ea
1514630001	4.6 x 25	2 µm	ea
1520010001	3.0 x 100	2 µm	ea
1520630001	3.0 x 100	2 µm	3/pk Validation Kit
1520020001	3.0 x 50	2 µm	ea
1520030001	3.0 x 25	2 µm	ea
1520060001	2.0 x 100	2 µm	ea
1520070001	2.0 x 50	2 µm	ea
1520620001	2.0 x 50	2 µm	3/pk Validation Kit
1520140001	2.0 x 25	2 µm	ea

Chromolith® HighResolution

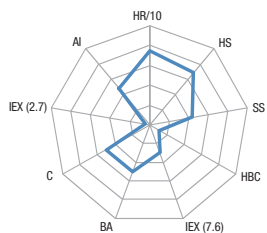
Whereas standard Chromolith® columns have 2 µm macropores, Chromolith® HighResolution columns possess 1.15 µm macropores. This results in higher efficiency, and improved peak shape. Although this causes higher back pressure, it is still less than half that of any particulate column of the same dimensions.

MILLIPORE SIGMA CHROMOLITH® HIGHRESOLUTION RP-18 ENDCAPPED

PART NO	SIZE (mm)	MACROPORE SIZE	QTY
1520230001	4.6 x 150	1.15 µm	ea
1520220001	4.6 x 100	1.15 µm	ea
1520190001	4.6 x 100	1.15 µm	3/pk Validation Kit
1520210001	4.6 x 50	1.15 µm	ea
1520200001	4.6 x 25	1.15 µm	ea

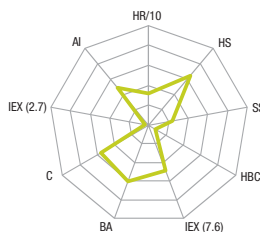
Thermo Scientific Accucore HPLC Columns

Accucore RP-MS



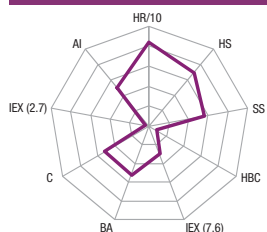
- Optimized for MS detection
- Excellent combination of speed and quality of separation

Accucore Phenyl-Hexyl



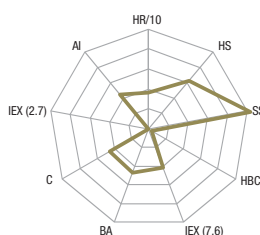
- Unique selectivity for aromatic and moderately polar analytes

Accucore C18



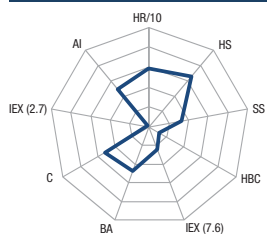
- Optimum retention for non-polar compounds

Accucore Phenyl-X



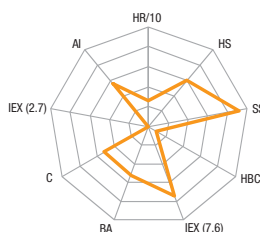
- Unique reversed-phase shape selectivity with high aromatic selectivity

Accucore C8



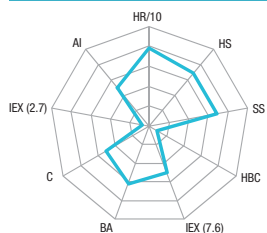
- Lower hydrophobicity than C18
- Recommended for analytes with moderate hydrophobicity

Accucore PFP



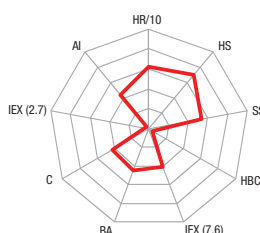
- Alternate selectivity to C18 particularly for halogenated analytes

Accucore aQ



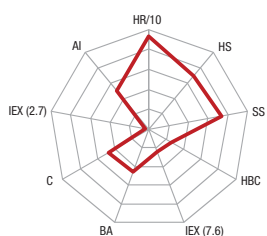
- Compatible with 100% aqueous mobile phases, special selectivity for polar analytes

Accucore C30



- High shape selectivity for hydrophobic, long chain, structurally related isomers

Accucore Polar Premium



- Rugged amide-embedded C18 phase that offers complementary selectivity to conventional C18 phases

Accucore HILIC

- Enhanced retention of polar and hydrophilic analytes

Accucore Urea-HILIC

- Unique HILIC selectivity and low ion exchange activity

THERMO SCIENTIFIC UNIGUARD HOLDER

DESCRIPTION	2.1/3.0 mm ID	4.0/4.6mm ID
Uniguard Drop-In Guard Cartridge Holder	852-00	850-00

THERMO SCIENTIFIC ACCUCORE COLUMN SPECIFICATIONS

PHASES	PORE SIZE	PARTICLE SIZE	pH RANGE	CARBON LOAD (%)	BACK PRESSURE RATING	TEMPERATURE RATING
Accucore RP-MS	80 Å	2.6 µm	2 – 9	7	1,000 bar	70 °C
Accucore C18	80 Å	2.6 µm	1 – 11	9	1,000 bar	70 °C
Accucore XL C18	80 Å	4 µm	1 – 11	7	600 bar	70 °C
Accucore C8	80 Å	2.6 µm	2 – 9	5	1,000 bar	70 °C
Accucore XL C8	80 Å	4 µm	2 – 9	4	600 bar	70 °C
Accucore aQ	80 Å	2.6 µm	2 – 9	9	1,000 bar	70 °C
Accucore Phenyl-Hexyl	80 Å	2.6 µm	2 – 8	5	1,000 bar	70 °C
Accucore Phenyl-X	80 Å	2.6 µm	2 – 8	6	1,000 bar	70 °C
Accucore PFP	80 Å	2.6 µm	2 – 8	5	1,000 bar	70 °C
Accucore HILIC	80 Å	2.6 µm	2 – 8	–	1,000 bar	70 °C
Accucore Urea-HILIC	80 Å	2.6 µm	2 – 8	–	1,000 bar	70 °C

SIZE (mm)	RP-MS	C18 (USP L1)	XL C18 (USP L1)	C8 (USP L7)	XL C8 (USP L7)	aQ C18 (USP L1)
4.6 x 250	–	–	74104-254630	–	74204-254630	–
4.6 x 150	17626-154630	17126-154630	74104-154630	17226-154630	74204-154630	17326-154630
4.6 x 100	17626-104630	17126-104630	74104-104630	17226-104630	74204-104630	17326-104630
4.6 x 50	17626-054630	17126-054630	74104-054630	17226-054630	74204-054630	17326-054630
4.6 x 10 Guard Cartridge*, 4/pk	17626-014005	17126-014005	74104-014001	17226-014005	74204-014001	17326-014005
3.0 x 250	–	–	74104-253030	–	74204-253030	–
3.0 x 150	17626-153030	17126-153030	74104-153030	17226-153030	74204-153030	17326-153030
3.0 x 100	17626-103030	17126-103030	74104-103030	17226-103030	74204-103030	17326-103030
3.0 x 50	17626-053030	17126-053030	74104-053030	17226-053030	74204-053030	17326-053030
3.0 x 10 Guard Cartridge*, 4/pk	17626-013005	17126-013005	74104-013001	17226-013005	74204-013001	17326-013005
2.1 x 250	–	–	74104-252130	–	74204-252130	–
2.1 x 150	17626-152130	17126-152130*	74104-152130	17226-152130	74204-152130	17326-152130
2.1 x 100	17626-102130	17126-102130*	74104-102130	17226-102130	74204-102130	17326-102130
2.1 x 50	17626-052130	17126-052130*	74104-052130	17226-052130	74204-052130	17326-052130
2.1 x 30	17626-032130	17126-032130	–	17226-032130	–	17326-032130
2.1 x 10 Guard Cartridge*, 4/pk	17626-012105	17126-012105	74104-012101	17226-012105	74204-012101	17326-012105

SIZE (mm)	Polar Premium (USP L60)	Phenyl-Hexyl (USP L11)	Phenyl-X	PFP (USP L43)	C30 (USP L62)	HILIC (USP L3)	Urea-HILIC
4.6 x 150	28026-154630	17926-154630	27926-154630	17426-154630	27826-154630	17526-154630	27726-154630
4.6 x 100	28026-104630	17926-104630	27926-104630	17426-104630	27826-104630	17526-104630	27726-104630
4.6 x 50	28026-054630	17926-054630	27926-054630	17426-054630	27826-054630	17526-054630	27726-054630
4.6 x 10 Guard Cartridge*, 4/pk	–	17926-014005	–	17426-014005	–	17526-014005	–
3.0 x 150	28026-153030	17926-153030	27926-153030	17426-153030	27826-153030	17526-153030	27726-153030
3.0 x 100	28026-103030	17926-103030	27926-103030	17426-103030	27826-103030	17526-103030	27726-103030
3.0 x 50	28026-053030	17926-053030	27926-053030	17426-053030	27826-053030	17526-053030	27726-053030
3.0 x 10 Guard Cartridge*, 4/pk	–	17926-013005	–	17426-013005	–	17526-013005	–
2.1 x 250	28026-252130	–	27926-252130	–	27826-252130	–	27726-252130
2.1 x 150	28026-152130	17926-152130	27926-152130	17426-152130	27826-152130	17526-152130	27726-152130
2.1 x 100	28026-102130	17926-102130	27926-102130	17426-102130	27826-102130	17526-102130	27726-102130
2.1 x 50	28026-052130	17926-052130	27926-052130	17426-052130	27826-052130	17526-052130	27726-052130
2.1 x 30	–	17926-032130	–	17426-032130	–	17526-032130	–
2.1 x 10 Guard Cartridge*, 4/pk	28026-012105	17926-012105	27926-012105	17426-012105	27826-012105	17526-012105	27726-012105

* Requires Uniguard Holder

Thermo Scientific Hypersil Gold

Hypersil GOLD

Excellent peak shape for all analyte types

Hypersil GOLD C8

Similar selectivity to C18 columns, but with reduced retention

Hypersil GOLD C4

Similar selectivity to C18 and C8 columns, but with reduced retention

Hypersil GOLD aQ

Polar endcapped C18 columns, stable in 100% aqueous mobile phase, providing enhanced retention and resolution of polar analytes

Hypersil GOLD PFP

Perfluorinated phenyl columns offering alternative selectivity. The fluorine atoms around the phenyl ring enhance pi-pi interactions with aromatic molecules

Hypersil GOLD Phenyl

Excellent retention and unique selectivity for aromatic analytes

Hypersil GOLD CN

Alternative selectivity with lower hydrophobicity and can also be used for normal phase separations

Hypersil GOLD Amino

Can be used in reversed phase, normal phase, ion exchange and HILIC modes and are particularly useful for separating carbohydrates

Hypersil GOLD SAX

A quaternary amine ion exchange ligand ideally for separating small polar organic analytes in aqueous mobile phases

Hypersil GOLD Silica

Separation of non-polar and moderately polar organic compounds by normal phase chromatography

Hypersil GOLD HILIC

Enhanced retention of polar and hydrophilic analytes that are problematic using reversed phase columns

THERMO SCIENTIFIC UNIGUARD HOLDER

DESCRIPTION	2.1/3.0 mm ID	4.0/4.6 mm ID
Uniguard Drop-In Guard Cartridge Holder	852-00	850-00

SIZE (mm)	PARTICLE SIZE	GOLD	C8	C4
4.6 x 150	3 µm	25003-154630	25203-154630	25503-154630
4.6 x 100	3 µm	25003-104630	25203-104630	25503-104630
4.6 x 50	3 µm	25003-054630	25203-054630	—
4.6 x 30	3 µm	25003-034630	—	—
4.0 x 150	3 µm	25003-154030	25203-154030	—
4.0 x 100	3 µm	25003-104030	25203-104030	—
4.0 x 50	3 µm	25003-054030	25203-054030	—
4.6 x 50	1.9 µm	25002-054630	25202-054630	—
3.0 x 100	1.9 µm	25002-103030	25202-103030	—
3.0 x 50	1.9 µm	25002-053030	25202-053030	—
2.1 x 200	1.9 µm	25002-202130	—	—
2.1 x 150	1.9 µm	25002-152130	25202-152130	25502-152130
2.1 x 100	1.9 µm	25002-102130	25202-102130	25502-102130
2.1 x 50	1.9 µm	25002-052130	25202-052130	25502-052130
2.1 x 30	1.9 µm	25002-032130	25202-032130	—
2.1 x 20	1.9 µm	25002-022130	25202-022130	—
1.0 x 100	1.9 µm	25002-101030	25202-101030	—
1.0 x 50	1.9 µm	25002-051030	—	—
1.0 x 30	1.9 µm	25002-031030	—	—
4.0/4.6 mm Guard*, 4/pk	3 µm	25003-014001	25203-014001	25503-014001
3.0 x 150	3 µm	25003-153030	25203-153030	25503-153030
3.0 x 100	3 µm	25003-103030	25203-103030	25503-103030
3.0 x 50	3 µm	25003-053030	25203-053030	—
3.0 x 30	3 µm	—	—	—
3.0 mm Guard*, 4/pk	3 µm	25003-013001	25203-013001	25503-013001
2.1 x 150	3 µm	25003-152130	25203-152130	25503-152130
2.1 x 100	3 µm	25003-102130	25203-102130	25503-102130
2.1 x 50	3 µm	25003-052130	25203-052130	25503-052130
2.1 x 30	3 µm	25003-032130	—	—
2.1 mm Guard*, 4/pk	3 µm	25003-012101	25203-012101	25503-012101
1.0 x 150	3 µm	25003-151030	—	25503-151030
1.0 x 100	3 µm	25003-101030	25203-101030	—
1.0 mm Guard*, 4/pk	3 µm	25003-011001	25203-011001	25503-011001
4.6 x 250	5 µm	25005-254630	25205-254630	25505-254630
4.6 x 150	5 µm	25005-154630	25205-154630	25505-154630
4.6 x 100	5 µm	25005-104630	25205-104630	25505-104630
4.6 x 50	5 µm	25005-054630	25205-054630	25505-054630
4.6 x 30	5 µm	25005-034630	—	—
4.0 x 250	5 µm	25005-254030	25205-254030	—
4.0 x 150	5 µm	25005-154030	25205-154030	—
4.0/4.6 mm Guard, 4/pk	5 µm	25005-014001	25205-014001	25505-014001
3.0 x 250	5 µm	25005-253030	25205-253030	25505-253030
3.0 x 150	5 µm	25005-153030	25205-153030	—
3.0 x 100	5 µm	25005-103030	25205-103030	25505-103030
3.0 x 50	5 µm	25005-053030	25205-053030	—
3.0 x 30	5 µm	25005-033030	—	—
3.0 mm Guard*, 4/pk	5 µm	25005-013001	25205-013001	25505-013001
2.1 x 250	5 µm	25005-252130	25205-252130	25505-252130
2.1 x 150	5 µm	25005-152130	25205-152130	25505-152130
2.1 x 100	5 µm	25005-102130	25205-102130	25505-102130
2.1 x 50	5 µm	25005-052130	25205-052130	25505-052130
2.1 x 30	5 µm	25005-032130	—	—
2.1 mm Guard*, 4/pk	5 µm	25005-012101	25205-012101	25505-012101

* Requires Uniguard Holder

Thermo Scientific Hypersil Gold HPLC COLUMNS

SIZE (mm)	PARTICLE SIZE	aQ	PPF	Phenyl	CN	Amino	SAX	Silica	HILIC
4.6 x 150	3 µm	25303-154630	25403-154630	25903-154630	25803-154630	25703-154630	26303-154630	25103-154630	26503-154630
4.6 x 100	3 µm	25303-104630	25403-104630	25903-104630	25803-104630	25703-104630	26303-104630	—	26503-104630
4.6 x 50	3 µm	25303-054630	25403-054630	—	—	—	—	—	26503-054630
4.6 x 30	3 µm	—	25403-034630	—	—	—	—	25103-034630	26503-034630
4.0 x 150	3 µm	25303-154030	—	—	—	—	—	—	—
4.0 x 100	3 µm	25303-104030	25403-104030	—	—	—	—	—	26503-104030
4.0 x 50	3 µm	25303-054030	25403-054030	—	—	—	—	—	26503-054030
4.6 x 50	1.9 µm	25302-054630	25402-054630	—	—	—	—	—	26502-054630
3.0 x 100	1.9 µm	25302-103030	25402-103030	—	—	—	—	—	26502-103030
3.0 x 50	1.9 µm	25302-053030	25402-053030	—	—	—	—	—	26502-053030
2.1 x 200	1.9 µm	25302-202130	25402-202130	25902-202130	25802-202130	25702-202130	—	25102-202130	26502-202130
2.1 x 150	1.9 µm	25302-152130	25402-152130	25902-152130	—	25702-152130	26302-152130	25102-152130	26502-152130
2.1 x 100	1.9 µm	25302-102130	25402-102130	25902-102130	25802-102130	25702-102130	26302-102130	25102-102130	26502-102130
2.1 x 50	1.9 µm	25302-052130	25402-052130	25902-052130	25802-052130	25702-052130	26302-052130	25102-052130	26502-052130
2.1 x 30	1.9 µm	25302-032130	25402-032130	—	—	—	—	—	26502-032130
2.1 x 20	1.9 µm	25302-022130	25402-022130	—	—	—	—	—	26502-022130
1.0 x 100	1.9 µm	25302-101030	25402-101030	—	—	—	—	—	26502-101030
1.0 x 50	1.9 µm	25302-051030	25402-051030	—	—	—	—	—	26502-051030
1.0 x 30	1.9 µm	—	—	—	—	—	—	—	—
4.0/4.6 mm Guard*, 4/pk	3 µm	25303-014001	25403-014001	25903-014001	25803-014001	25703-014001	26303-014001	25103-014001	26503-014001
3.0 x 150	3 µm	25303-153030	25403-153030	25903-153030	25803-153030	25703-153030	26303-153030	25103-153030	26503-153030
3.0 x 100	3 µm	25303-103030	25403-103030	25903-103030	25803-103030	25703-103030	26303-103030	25103-103030	26503-103030
3.0 x 50	3 µm	25303-053030	25403-053030	—	—	—	—	—	26503-053030
3.0 x 30	3 µm	25303-033030	25403-033030	—	—	—	—	—	26503-033030
3.0 mm Guard*, 4/pk	3 µm	25303-013001	25403-013001	25903-013001	25803-013001	25703-013001	26303-013001	25103-013001	26503-013001
2.1 x 150	3 µm	25303-152130	25403-152130	—	25803-152130	25703-152130	26303-152130	25103-152130	26503-152130
2.1 x 100	3 µm	25303-102130	25403-102130	25903-102130	25803-102130	25703-102130	26303-102130	25103-102130	26503-102130
2.1 x 50	3 µm	25303-052130	25403-052130	25903-052130	25803-052130	25703-052130	26303-052130	25103-052130	26503-052130
2.1 x 30	3 µm	25303-032130	25403-032130	—	25803-032130	25703-032130	—	25103-032130	26503-032130
2.1 mm Guard*, 4/pk	3 µm	25303-012101	25403-012101	25903-012101	25803-012101	25703-012101	26303-012101	25103-012101	26503-012101
1.0 x 150	3 µm	25303-151030	25403-151030	25903-151030	25803-151030	25703-151030	26303-151030	25103-151030	26503-151030
1.0 x 100	3 µm	25303-101030	25403-101030	—	—	—	—	—	26503-101030
1.0 mm Guard*, 4/pk	3 µm	25303-011001	25403-011001	25903-011001	25803-011001	25703-011001	26303-011001	25103-011001	26503-011001
4.6 x 250	5 µm	25305-254630	25405-254630	25905-254630	25805-254630	25705-254630	26305-254630	25105-254630	26505-254630
4.6 x 150	5 µm	25305-154630	25405-154630	25905-154630	25805-154630	25705-154630	26305-154630	25105-154630	26505-154630
4.6 x 100	5 µm	25305-104630	25405-104630	—	—	—	26305-104630	25105-104630	26505-104630
4.6 x 50	5 µm	25305-054630	—	25905-054630	25805-054630	25705-054630	26305-054630	—	—
4.6 x 30	5 µm	—	—	—	—	—	—	—	—
4.0 x 250	5 µm	25305-254030	25405-254030	25905-254030	25805-254030	25705-254030	—	25105-254030	26505-254030
4.0 x 150	5 µm	—	25405-154030	—	—	—	—	—	26505-154030
4.0/4.6 mm Guard*, 4/pk	5 µm	25305-014001	25405-014001	25905-014001	25805-014001	25705-014001	26305-014001	25105-014001	26505-014001
3.0 x 250	5 µm	—	—	25905-253030	25805-253030	25705-253030	26305-253030	—	—
3.0 x 150	5 µm	25305-153030	25405-153030	—	—	—	—	—	26505-153030
3.0 x 100	5 µm	25305-103030	25405-103030	25905-103030	25805-103030	25705-103030	26305-103030	25105-103030	26505-103030
3.0 x 50	5 µm	25305-053030	25405-053030	—	—	—	—	—	26505-053030
3.0 x 30	5 µm	—	—	—	—	—	—	—	—
3.0 mm Guard*, 4/pk	5 µm	25305-013001	25405-013001	25905-013001	25805-013001	25705-013001	26305-013001	25105-013001	26505-013001
2.1 x 250	5 µm	25305-252130	25405-252130	—	25805-252130	25705-252130	26305-252130	25105-252130	26505-252130
2.1 x 150	5 µm	25305-152130	25405-152130	—	25805-152130	—	26305-152130	25105-152130	26505-152130
2.1 x 100	5 µm	25305-102130	25405-102130	25905-102130	25805-102130	25705-102130	26305-102130	25105-102130	26505-102130
2.1 x 50	5 µm	25305-052130	25405-052130	25905-052130	25805-052130	25705-052130	26305-052130	25105-052130	26505-052130
2.1 x 30	5 µm	—	—	—	—	—	—	—	—
2.1 mm Guard*, 4/pk	5 µm	25305-012101	25405-012101	25905-012101	25805-012101	25705-012101	26305-012101	25105-012101	26505-012101

* Requires Uniguard Holder

Vydac HPLC/MS Columns

- Low or NO TFA requirement for sharp symmetrical peptide peaks
- Retention and selectivity options for a variety of protein and peptide samples

ID (µm)	LENGTH (mm)	C4-POLYMERIC	C8-POLYMERIC	C18-POLYMERIC	C18-MONOMERIC
500	250	214MS5.525	208MS5.525	218MS5.525	238MS5.525
500	150	214MS5.515	208MS5.515	218MS5.515	238MS5.515
500	100	214MS5.510	208MS5.510	218MS5.510	238MS5.510
500	50	214MS5.505	208MS5.505	218MS5.505	238MS5.505
300	250	214MS5.325	208MS5.325	218MS5.325	238MS5.325
300	150	214MS5.315	208MS5.315	218MS5.315	238MS5.315
300	100	214MS5.310	208MS5.310	218MS5.310	238MS5.310
300	50	214MS5.305	208MS5.305	218MS5.305	238MS5.305
150	250	214MS5.1525	208MS5.1525	218MS5.1525	238MS5.1525
150	150	214MS5.1515	208MS5.1515	218MS5.1515	238MS5.1515
150	100	214MS5.1510	208MS5.1510	218MS5.1510	238MS5.1510
150	50	214MS5.1505	208MS5.1505	218MS5.1505	238MS5.1505
75	250	214MS5.07525	208MS5.07525	218MS5.07525	238MS5.07525
75	150	214MS5.07515	208MS5.07515	218MS5.07515	238MS5.07515
75	100	214MS5.07510	208MS5.07510	218MS5.07510	238MS5.07510
75	50	214MS5.07505	208MS5.07505	218MS5.07505	238MS5.07505
1.0	250	214MS51	208MS51	218MS51	238MS51
Guard kit (1 holder, 1 cartridge)		214GK51MS/N	208GK51MS/N	218GK51MS/N	238GK51MS/N
Repl guard cartridge, 2/pk		214GD51MS/N	208GD51MS/N	218GD51MS/N	—
2.1	250	214MS52	208MS52	218MS52	238MS52
Guard kit (1 holder, 1 cartridge)		—	208GK52MS/N	218GK52MS/N	238GK52MS/N
Repl guard cartridge, 2/pk		214GD52MS/N	208GD52MS/N	218GD52MS/N	238GD52MS/N
4.6	250	214MS54	208MS54	218MS54	238MS54
Guard kit (1 holder, 1 cartridge)		214GK54MS/N	208GK54MS/N	218GK54MS/N	238GK54MS/N
Repl guard cartridge, 2/pk		214GD54MS/N	208GD54MS/N	218GD54MS/N	238GD54MS/N

Vydac 201TP™ and 202TP™

201TP SPECIALTY REVERSED PHASE COLUMN, C18 300Å			
DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	PART NO
Column	4.6 x 250	5	201TP54
Column	4.6 x 150	5	201TP5415
Column	3.0 x 150	5	201TP5310
Column	3.0 x 100	5	201TP5315
Guard Kit (1 holder, 1 cartridge)	4.6	5	201GK54T/N
Repl guard cartridge, 2/pk	4.6	5	201GD54T/N
Guard Kit (1 holder, 1 cartridge)	4.6	10	201GK104T/N
Repl guard cartridge, 2/pk	4.6	10	201GD104T/N
Column	2.1 x 250	5	201TP52
Column	2.1 x 150	5	201TP5215
Column	1.0 x 250	5	201TP51
Column	1.0 x 150	5	201TP5115
Guard Kit (1 holder, 1 cartridge)	2.1	5	201GK52T/N
Repl guard cartridge, 2/pk	2.1	5	201GD52T/N

202TP HIGH CARBON LOAD REVERSED PHASE COLUMN, C18 300Å			
DESCRIPTION	LENGTH (mm)	PARTICLE SIZE (µm)	PART NO
Column	4.6 x 150	5	202TP5415
Guard holder	4.6	5	80101/N
Guard cartridge, 2/pk	4.6	5	202GD54T/N
Connector, Guard to Column	—	—	U-287

- 201TP columns separate the EPA 16 priority pollutants in less than 20 minutes
- 202TP Rapid-analysis columns separate the 16 priority pollutant PAHs in under 10 minutes
- 202TP columns for the analysis of derivatized PAHs



Vydac 208TP™, 214TP™, 218TP™, 219TP™, and 238TP™

208TP™

- ➔ Peptides up to 10,000-20,000 MW
- ➔ Enzymatic digest fragments
- ➔ Natural and synthetic peptides

214TP™

- ➔ Glycoproteins
- ➔ Hemoglobin variants
- ➔ Histones
- ➔ Human growth hormone
- ➔ Insulin variants
- ➔ Membrane proteins

218TP™

- ➔ Small polypeptides less than 4,000-5,000 MW
- ➔ Enzymatic digest fragments
- ➔ Natural and synthetic peptides

219TP™

- ➔ Polypeptides with aromatic side chains
- ➔ Large, hydrophobic proteins
- ➔ Membrane-spanning peptides
- ➔ Lipid peptides
- ➔ Fusion proteins from inclusion bodies

238TP™

- ➔ Small polypeptides less than 4,000-5,000 MW
- ➔ Enzymatic digest fragments
- ➔ Natural and synthetic peptides
- ➔ Complex carbohydrates

DESCRIPTION	SIZE (mm)	PARTICLE SIZE (µm)	208TP C8 300Å	214TP C4 300Å	218TP POLYMERIC C18 300Å	219TP DIPHENYL 300Å	238TP MONOMERIC C18 300Å
Column	10 x 250	5	208TP510	214TP510	218TP510	219TP510	238TP510
Guard Kit (1 holder, 1 cartridge)	10	12	208FSK1210/N	214FSK1210/N	218FSK1210/N	219FSK1210/N	—
Repl guard cartridge, 2/pk	10	12	208GCC1210/N	214GCC1210/N	218GCC1210/N	219GCC1210/N	—
Column	4.6 x 250	5	208TP54	214TP54 214ATP54*	218TP54	219TP54	238TP54
Column	4.6 x 150	5	208TP5415	214TP5415	218TP5415	219TP5415	238TP5415
Column	4.6 x 50	5	208TP5405	214TP5405	218TP5405	219TP5405	238TP5405
Column	4.6 x 100	3	208TP3410	214TP3410	218TP3410	—	238TP3410
Column	4.6 x 50	3	208TP3405	214TP3405	—	—	—
Column	3.0 x 250	5	208TP53	214TP53	218TP53	219TP53	238TP53
Column	3.0 x 150	5	208TP5315	214TP5315	—	219TP5315	238TP5315
Guard Kit (1 holder, 1 cartridge)	4.6	10	208GK104/N	214GK104/N	218GK104/N	219GK104/N	—
Repl guard cartridge, 2/pk	4.6	10	208GD104/N	214GD104/N	218GD104/N	219GD104/N	—
Guard Kit (1 holder, 1 cartridge)	4.6	5	208GK54/N	214GK54/N	218GK54/N	219GK54/N	238GK54/N
Repl guard cartridge, 2/pk	4.6	5	208GD54/N	214GD54/N	218GD54/N	219GD54/N	238GD54/N
Column	2.1 x 250	5	208TP52	214TP52	218TP52	219TP52	238TP52
Column	2.1 x 150	5	208TP5215	214TP5215	218TP5215	219TP5215	238TP5215
Column	2.1 x 50	5	208TP5205	214TP5205	218TP5205	219TP5205	238TP5205
Guard Kit (1 holder, 1 cartridge)	2.1	5	208GK52/N	214GK52/N	218GK52/N	219GK52/N	238GK52/N
Repl guard cartridge, 2/pk	2.1	5	208GD52/N	214GD52/N	218GD52/N	219GD52/N	238GD52/N
Column	1.0 x 250	5	208TP51	214TP51	218TP51	219TP51	238TP51
Column	1.0 x 150	5	208TP5115	214TP5115	218TP5115	219TP5115	238TP5115
Column	1.0 x 50	5	208TP5105	214TP5105	218TP5105	219TP5105	238TP5105
Guard Kit (1 holder, 1 cartridge)	1.0	5	208GK51/N	214GK51/N	218GK51/N	—	238GK51/N
Repl guard cartridge, 2/pk	1.0	5	208GD51/N	214GD51/N	218GD51/N	—	238GD51/N

*214ATP54 is optimized for use in stability analysis of human growth hormone

Zirchrom LC Columns

PBD (USP L49)

- Great peak shapes for basic compounds

ZirChrom®-PBD is produced by coating ultra-stable zirconia particles with an equally stable extremely thin layer of crosslinked polybutadiene. The chemical selectivity is similar to that of a traditional C8 or C18 silica based column for non-ionic analytes. In the case of ionizable analytes there are secondary interactions which can be used to fine tune the chromatographic selectivity (band spacing).

The surface chemistry of zirconia is very rich and may be used to change chemical selectivity of the column simply through the addition of mobile phase additives. Consider using ZirChrom®-PBD with a phosphate buffer if either the tailing of amines or their selectivities are problematic on C18 silica, and explore the full pH range (pH 1-14) to optimize your separation. For example, a 20 mM phosphate buffer will produce good peak shapes for many ionizable compounds.

CARB

ZirChrom®-CARB is produced by coating a zirconia particle with an extremely thin layer of elemental carbon. The resulting phase gives very different selectivity than any bonded or polymeric phase, and represents an excellent alternative when bonded phases do not provide the required selectivity.

ZirChrom®-CARB is great for geometric isomer separations, and is superb for separating diastereomers. The selectivity is more different from ODS than phenyl or cyano phases. This makes it an excellent choice for orthogonal screening in drug discovery and impurity profiling. Proper buffer selection helps to ensure the best peak shapes and band spacing. ZirChrom®-CARB is stable from pH 1 – 14, and up to 200 °C.

C18

- Ideal for separating steroids and analogues
- Excellent selectivity for acidic compounds
- pH stable from 1 – 14 for robust methods
- Excellent thermal stability for fast separations

DiamondBond®-C18 is made by covalently bonding C18 ligands to the surface of carbon-clad zirconia. This creates the first truly bonded carbon phases in the industry. Because the surface below the C18 ligands is carbon and not silica, DiamondBond®-C18 has different selectivity from other phases. DiamondBond®-C18 has better peak shapes than unmodified carbon phases, and unique selectivity compared to silica phases. Life for all traditional reversed-phase zirconia products, proper buffer selection helps to ensure the best peak shapes and band spacing.

ZirChrom® Ion Exchangers

- Phases for sugars and proteins
- Wide range of ion exchange selectivity
- No shrinking or swelling—use any organic solvent
- Significantly higher efficiency than polymeric phases

ZirChrom ion exchange phase is produced by coating ultra-stable zirconia particles with an extremely thin layer of an ionic polymer. This method creates phases with much higher efficiency and, oftentimes, higher capacity than pure polymeric phases. Also, ZirChrom's ion exchangers do not shrink or swell as a function of ionic strength or organic modifier content of the mobile phase.

ZirChrom's SAX phase is thermally stable up to 80 °C, which causes different selectivity, allowing high speed separations with lower ionic strength mobile phases. This is very important in the preparation of RNA and DNA samples. If desired, mixed-mode separation modes may be exploited to optimize separations, including Lewis acid-base interactions, hydrophobic interactions and ion-exchange interactions. These modes may be attenuated by adjusting the strong Lewis base content, organic content and ionic strength of the mobile phase, respectively.

WAX (Stable from pH 3 – 9, and to 80 °C)

- Cross-linked polyethyleneimine-coated zirconia for weak anion-exchange
- Efficient weak anion-exchanger useful for inorganic and organic anions
- Useful for the separation of bio-molecules such as nucleotides, nucleosides, oligonucleotides, oligodeoxynucleotides, amino acids, peptides, and proteins
- Extremely stable amino phase for normal phase separation of carbohydrates.

SAX (Stable from pH 1 – 2, and to 80 °C)

- Cross-linked polyethyleneimine-coated zirconia for strong anion-exchange
- Useful for inorganic and organic anions
- Ideal for the separation of water-soluble vitamins
- Useful for the separation of bio-molecules such as nucleotides, nucleosides, oligonucleotides, oligodeoxynucleotides, amino acids, and peptides

Zirchrom LC Columns

SIZE (mm)	PARTICLE SIZE (µm)	PBD	CARB	Diamond Bond C18	WAX	SAX
4.6 x 250 mm	5	ZR03-2546-5	ZR01-2546-5	DB01-2546-5	ZR05-2546-5	ZR06-2546-5
4.6 x 150 mm	5	ZR03-1546-5	ZR01-1546-5	DB01-1546-5	ZR05-1546	ZR06-1546-5
4.6 x 100 mm	5	ZR03-1046-5	ZR01-1046-5	DB01-1046-5	ZR05-1546-5	ZR06-1046-5
4.6 x 50 mm	5	ZR03-0546-5	ZR01-0546-5	DB01-0546-5	ZR05-0546-5	ZR06-0546-5
4.6 x 250 mm	3	ZR03-2546	ZR01-2546	DB01-2546	ZR05-0546	ZR06-2546
4.6 x 150 mm	3	ZR03-1546	ZR01-1546	DB01-1546	ZR05-2546	ZR06-1546
4.6 x 100 mm	3	ZR03-1046	ZR01-1046	DB01-1046	ZR05-1046	ZR06-1046
4.6 x 50 mm	3	ZR03-0546	ZR01-0546	DB01-0546	ZR05-1046-5	ZR06-0546
4.6 mm Guard, 3/pk		ZR03-G40	ZR01-G40	DB01-G40	ZR05-G40	ZR06-G40
2.1 x 250 mm	5	ZR03-2521-5	ZR01-2521-5	DB01-2521-5	ZR05-2521-5	ZR06-2521-5
2.1 x 150 mm	5	ZR03-1521-5	ZR01-1521-5	DB01-1521-5	ZR05-1521-5	ZR06-1521-5
2.1 x 100 mm	5	ZR03-1021-5	ZR01-1021-5	DB01-1021-5	ZR05-1021-5	ZR06-1021-5
2.1 x 50 mm	5	ZR03-0521-5	ZR01-0521-5	DB01-0521-5	ZR05-0521-5	ZR06-0521-5
2.1 x 250 mm	3	ZR03-2521	ZR01-2521	DB01-2521	ZR05-2521	ZR06-2521
2.1 x 150 mm	3	ZR03-1521	ZR01-1521	DB01-1521	ZR05-1521	ZR06-1521
2.1 x 100 mm	3	ZR03-1021	ZR01-1021	DB01-1021	ZR05-1021	ZR06-1021
2.1 x 50 mm	3	ZR03-0521	ZR01-0521	DB01-0521	ZR05-0521	ZR06-0521
2.1 mm Guard, 3/pk		ZR03-G20	ZR01-G20	DB01-G20	ZR05-G20	ZR06-G20



Zirchrom ProTain® In-Line Protein Removal System

The HPLC analysis of small molecules in matrices containing proteins of variable origin is often problematic because of poor resolution between the analyte of interest and the matrix constituents and potential fouling of the analytical column by matrix proteins and debris. The incorporation of ZirChrom's new ProTain® in-line protein removal system upstream of any type of analytical column offers a selective, cost effective and simple method of reducing matrix interferences for the HPLC analysis of small molecules in bio-samples.

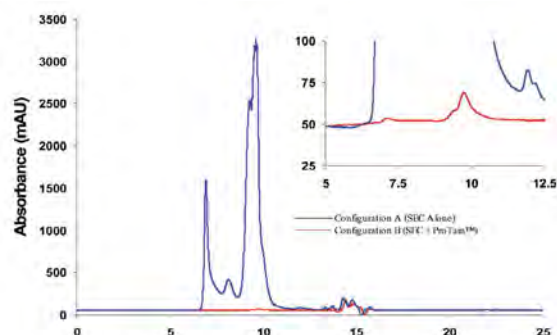
The type of buffer, specifically its strength as a Lewis base, and the pH of the mobile phase play a significant role in determining the actual protein binding capacity of the ProTain® systems.

ZirChrom's ProTain® in-line protein removal system is comprised of one ProTain® system insert and one ProTain® system holder. A section of capillary tubing and all of the necessary nuts and ferrules are included with holder.

ZIRCHROM PROTAIN IN-LINE PROTEIN REMOVAL SYSTEM

SIZE	PART NO
4.6 mm x 2 cm (3/pk)	PT01-0246
4.6 mm Holder	ZR850-00-2
2.1 mm x 2 cm (3/pk)	PT01-0221
2.1 mm Holder	ZR852-00-2

In-Line Removal of Matrix Proteins in HPLC Analysis of Small Molecules



Column A: TSK G3000 Size Exclusion Column
 Column B: ZirChrom's in-line ProTain Removal System installed in front of the TSK G3000 SEC column

Mobile Phase: 10mM Phosphate buffer at pH 6.8, 1.0 mL/min
 Detector: UV @ 215 nm

GC Columns

Agilent J&W Low Bleed & Ultra Inert	152	Agilent J&W Specialty Columns	184
DB-WAX Ultra Inert	152	High Temperature	184
DB-1ms Low-Bleed	153	Petroleum	185
HP-1ms Low-Bleed	154	Select Biodiesel	187
DB-5ms Low-Bleed	155	Pesticides	188
HP-5ms Low-Bleed	157	PAH	189
DB-XLB Low-Bleed	158	Semivolatile	190
DB-35ms Low-Bleed	159	Volatile	191
DB-17ms Low-Bleed	160	Food, Flavors & Fragrances	193
DB-VF-200ms Low-Bleed	160	Life Sciences	195
DB-225ms	161	Metal Columns	197
DB-624 Ultra Inert	161	Plot Columns	198
DB-UI 8270D Ultra Inert	161		
Agilent J&W Polysiloxane	162	Restek High Performance	204
DB-1	162	Rxi [®] -1ms Columns	204
HP-1	164	Rxi [®] -XLB Columns	204
CP-Sil 5 CB	166	Rxi [®] -5ms Columns	205
CP-SIL 5 CB UltiMetal	168	Rxi [®] -5Sil MS Columns	205
Ultra 1	168	Rxi [®] -35Sil MS Columns	206
Ultra 2	168	Rxi [®] -17 Columns	206
DB-5	169	Rxi [®] -17Sil MS Columns	206
HP-5	170	Rxi [®] -PAH Columns	207
CP-Sil 8 CB	171	Rxi [®] -624Sil MS Columns	207
HP-35 & DB-35	173	Rxi [®] -1HT Columns	207
DB-17	173	Rxi [®] -5HT Columns	207
DB-23	174		
DB-200	174	Restek General Performance	208
DB-210	175	Rtx [®] -1 Columns	208
DB-225	175	Rtx [®] -5 Columns	209
DB-1301	175	Rtx [®] -5MS—Low Bleed GC-MS	209
DB-1701	176	Rt [®] -2560 Column	210
CP-Sil 19 CB	177	Rtx [®] -Wax Columns	210
Agilent J&W Polyethylene Glycol	178	Stabilwax [®] Columns	211
DB-WAX & DB-WaxFF	178	Stabilwax [®] -MS Columns	211
DB-WAXetr	179		
HP-INNOWax	180		
CP-Wax 52 CB	181		
Carbowax 20M & HP-20M	182		
HP- FFAP	182		
DB-FFAP	183		



Featured Products

152 Agilent J&W Ultra Inert GC Columns



↑	High Polar	DB-WAX UI	152
	Mid Polar	DB-35ms UI DB-624 UI	159 161
↑	Non/Low Polar	DB-5ms UI	156
		HP-5ms UI	157
		DB-1ms UI HP-1ms UI	153 154

Application Specific Ultra Inert Columns

DB-UI 8270D: Environmental semivolatiles
DB-Select 624 UI for 467: Pharmaceutical residual solvents



CHROM TECH RELATED PRODUCTS



UltiMetal Plus Ultimate Union, page 371

Leak-free connection of guard columns or retention gaps



Agilent Premium Non-Stick Septa, page 365

The mass spectrum of septum bleed can look very much like GC column bleed, so the two are often confused. An easy way to tell the two apart: column bleed will be indicated by a rise in the baseline, not peaks. If you see bleed peaks, these generally come from lower quality septa or septa being used beyond their temperature limits. To minimize septa contributions to background bleed, use quality Agilent BTO, Long Life, or Advanced Green septa.



Agilent Certified Vials, page 18



Agilent Gas Clean Filters, page 395

The Agilent Gas Clean Filter System delivers clean gases, reducing the risks of column damage, sensitivity loss, and instrument downtime.



Agilent ADM Flowmeter, page 392

The Agilent ADM Flow Meter is a reliable platform for measuring volumetric gas flow without having to know the gas composition (limited to non-caustic gases). Moreover, the Agilent ADM Flow Meter does not have to be shipped back for recalibration to maintain NIST-Traceable standards.

Notes from the Support Desk

Why Two Max Temperatures?

The first max temperature is the max isothermal operating temperature, which provides good thermal stability with minimal bleed generation. Second is the max programmed operating temperature, which is intended to be used sparingly and in short duration—for example, during column conditioning to remove contamination or to elute high molecular weight analytes which otherwise may not come off the column at lower temperatures.

Basically, max temp limits are designed to be a three-way compromise balancing column bleed, performance, and lifetime (i.e. – the lowest bleed with the best performance and longest lifetime).

TEMP LIMITS (°C)
-60 to 325/350

Notes from the Support Desk
(continued on next page)

Notes from the Support Desk

Stationary Phase

Resolution Equation and Factors that Affect it:

$$R = \frac{1}{4} \sqrt{N} \times \left(\frac{k}{k+1} \right) \times (\alpha - 1)$$

A measure of *Efficiency*

This term is affected by:

Length
Inner diameter
Carrier gas type and linear velocity

$N = L/H$ = Effective theoretical plate number
 L = Column length

A measure of *Retention*

This term is affected by:

Inner diameter
Film thickness
Temperature

H = HETP = Height equivalent to a theoretical plate
 k = Retention factor

A measure of *Peak Separation*

This term is affected by:

Stationary phase composition
Temperature

α = Separation factor
Baseline resolution ($R = 1.5$) is the goal

Choosing the right stationary phase is the first step toward optimizing your GC separation. It is the most important decision you will make because separation factor (α) has the greatest impact on resolution, and it is strongly affected by stationary phase polarity and selectivity.

Stationary phase *polarity* is determined by the type and amount of functional groups in the stationary phase. When choosing a column, consider the polarity of both the stationary phase and your target analytes. If the stationary phase and analyte polarities are similar, then the attractive forces are strong and more retention will result. Greater retention often results in increased resolution. Stationary phase polarity strongly influences column selectivity and separation factor, making it a useful consideration when selecting a column.

Stationary phase *selectivity* is defined by IUPAC as the extent to which other substances interfere with the determination of a given substance. Selectivity is directly related to stationary phase composition and how it interacts with target compounds through intermolecular forces (i.e., hydrogen bonding, dispersion, dipole-dipole interactions, and shape selectivity). As methyl groups in the stationary phase are replaced by different functionalities, such as phenyl or cyanopropyl pendant groups, compounds that are more soluble with those functional groups (i.e., aromatics or polar compounds, respectively) will interact more and be retained longer, often leading to better resolution and increased selectivity.

Select Column Film Thickness and Column ID Based on Retention Factor

Film Thickness

Thin Film

0.10 μm – 0.50 μm

Characteristics

Shorter retention times
Lower bleed
Higher maximum temperatures
Lower sample loading capacity
Higher resolution for high molecular weight compounds

Applications

Medium and high molecular weight compounds

Thick Film

1.0 μm –10.0 μm

Characteristics

Longer retention times
Higher bleed
Lower maximum temperatures
Higher sample loading capacity
High resolution for volatiles and low molecular weight compounds

Applications

Volatile, low molecular weight compounds
High concentration samples (e.g., purity testing)

As film thickness increases, retention, sample loading capacity, and column bleed increase; whereas, maximum temperature decreases.

Notes from the Support Desk

Inner Diameter

Small ID		Large ID
0.15 mm – 0.18 mm Characteristics Highest efficiency Shorter analysis time Lower sample loading capacity Applications Highly complex samples Fast GC GC-MS Split injection	0.25 mm – 0.32 mm Characteristics High efficiency Good performance for analysis time and sample loading capacity Applications Complex samples Wide concentration range Split, splitless, direct, headspace, and on-column injection	0.53 mm Characteristics Good efficiency Longer analysis time Higher sample loading capacity May require higher flow rates than MS detectors can tolerate Applications Packed column replacement Purity analysis Split, splitless, direct, headspace, and on-column injection

As inner diameter increases, efficiency decreases, sample loading capacity increases, optimal flow rate increases, and analysis time increases.

TECH TIP

When choosing column ID, the injection technique is also important because the column ID may need to be selected based on whether a split, splitless, direct, cool on-column injection, or other sample transfer method is being used. For example, 0.53 mm ID columns are ideal for cool on-column injections since the syringe needle (26 gauge) will fit into the large column ID. In addition, the detector and its optimal flow rate must be considered. Some MS detectors can only operate under column flow rates of up to 1.5 mL/min; therefore, a 0.53 mm ID column, which requires higher flows for proper chromatography, is not an option for MS work.

Length

Short Length		Long Length
5 m – 15 m Characteristics Good efficiency Short analysis times Applications Sample with few compounds	20 m – 30 m Characteristics Better efficiency Moderate analysis times Applications More complex samples	50 m – 150 m Characteristics Best efficiency Longer analysis times Applications Very complex samples

Longer Columns Can Increase Resolution...

Doubling the column length only increases resolution by approximately 40% because the column length is under the square root function in the efficiency term of the resolution equation.

But, Longer Columns Increase Cost and Analysis Time

On longer columns, analysis time is increased by as much as a factor of two. Longer columns are also more expensive.

These notes and charts have been prepared by Restek to help improve lab productivity.

Agilent J&W GC Columns

Agilent J&W Low-Bleed GC/MS Columns

What makes an Agilent J&W low-bleed column exceptional? Unique polymer chemistry and proprietary surface deactivation, both of which have contributed to columns that adhere to the tightest quality control specifications in the industry for bleed, inertness, selectivity and efficiency. Agilent J&W "ms" columns utilize special surface deactivation and siloxane chemistries which enhance the chromatographic performance of siloxane polymers.

Agilent J&W Ultra Inert GC Columns

The Agilent J&W Ultra Inert GC column family pushes industry standards for consistent column inertness and exceptionally low column bleed, resulting in lower detection limits and more accurate data for difficult analytes. Each Ultra Inert column is tested with the industry's most demanding test probe mixture and we prove it with a performance summary sheet shipped with each column.

Which Ultra Inert GC column is best for your application?

↑	High Polar	DB-WAX UI
	Mid Polar	DB-35ms UI DB-624 UI
	Non/Low Polar	DB-5ms UI HP-5ms UI DB-1ms UI HP-1ms UI

Application Specific Ultra Inert Columns

DB-UI 8270D: Environmental semivolatiles
DB-Select 624 UI for 467: Pharmaceutical residual solvents



Agilent DB-WAX Ultra Inert NEW!

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	INTUVO
0.18	20	0.18	20 to 250/260	121-7022UI	—
		0.30	20 to 240/250	121-7023UI	—
0.20	25	0.20	20 to 250/260	128-7022UI	—
0.25	15	0.25	20 to 250/260	122-7012UI	—
		0.50	20 to 240/250	122-7033UI	122-7033UI-INT
	30	0.25	20 to 250/260	122-7032UI	122-7032UI-INT
		0.50	20 to 240/250	122-7033UI	122-7033UI-INT
0.32	15	0.25	20 to 250/260	123-7012UI	—
		0.50	20 to 240/250	123-7033UI	123-7033UI-INT
	30	0.25	20 to 250/260	123-7032UI	123-7032UI-INT
		0.50	20 to 240/250	123-7063UI	—
0.53	15	1.00	20 to 230/240	125-7012UI	—
		0.25	20 to 230/240	125-7031UI	—
	30	0.50	20 to 230/240	125-7037UI	—
		1.00	20 to 230/240	125-7032UI	—
	60	1.00	20 to 230/240	125-7062UI	—
		1.00	20 to 230/240	125-7062UI	—

NEW! DB-WAX UI

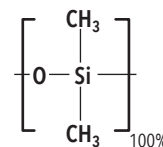
DB-WAX methods containing active compounds such as alcohols, carboxylic acids, and aldehydes are easily upgraded to DB-WAX UI, with minimal validation and without having to recreate or modify existing compound libraries based on DB-WAX selectivity.



Intuvo columns for the Agilent Intuvo GC include smart keys which enable immediate identification of the column configuration, temperature limits, and monitors usage.

Agilent DB-1ms Low-Bleed

- ➔ 100% Dimethylpolysiloxane
- ➔ Identical selectivity to DB-1
- ➔ Non-polar
- ➔ Very low bleed characteristics, ideal for GC/MS
- ➔ Improved acid performance compared to standard 100% Dimethylpolysiloxane columns
- ➔ Improved signal-to-noise ratio for better sensitivity and mass spectral integrity
- ➔ 340/360 °C upper temperature limit
- ➔ Excellent general purpose column
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable



Similar Phases: SPB-1, Rtx-1, BP-1, OV-1, OV-101, 007-1(MS), SP-2100, SE-30, ZB-1, AT-1, MDN-1, ZB-1, ZB-1ms

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	5975T LTM TOROID
0.10	10	0.10	-60 to 340/360	127-0112	—	127-0112LTM	—
		0.40	-60 to 340/360	127-0113	—	—	—
	20	0.10	-60 to 340/360	127-0122	—	—	—
		0.40	-60 to 340/360	127-0123	—	—	—
0.18	20	0.18	-60 to 340/360	121-0122	—	121-0122LTM	221-0122LTM
0.20	12	0.33	-60 to 340/350	128-0112	—	—	—
	25	0.33	-60 to 340/350	128-0122	128-0122E	—	—
0.25	15	0.25	-60 to 340/360	122-0112	122-0112E	122-0112LTM	222-0112LTM
		0.10	-60 to 340/360	122-0131	—	—	—
	30	0.25	-60 to 340/360	122-0132	122-0132E	—	222-0132LTM
		0.25	-60 to 340/360	122-0162	—	—	—
0.32	15	0.25	-60 to 340/360	123-0112	—	—	—
		0.10	-60 to 340/360	123-0131	—	—	—
	30	0.25	-60 to 340/360	123-0132	—	—	—
		0.25	-60 to 340/360	123-0162	—	—	—

DB-1ms Ultra Inert

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	INTUVO
0.18	20	0.18	-60 to 325/350	121-0122UI	—	—
0.25	15	0.25	-60 to 325/350	122-0112UI	—	122-0112UI-INT
		0.25	-60 to 325/350	122-0132UI	122-0132UIE	122-0132UI-INT
	60	0.25	-60 to 325/350	122-0162UI	—	122-0162UI-INT
0.32	15	0.25	-60 to 325/350	123-0112UI	—	—
	30	0.25	-60 to 325/350	123-0132UI	—	123-0132UI-INT



Intuvo columns for the Agilent Intuvo GC include smart keys which enable immediate identification of the column configuration, temperature limits, and monitors usage.



CHROM TECH RELATED PRODUCTS



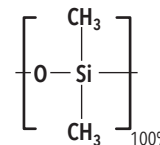
UltiMetal Plus Ultimate Union, page 371
Leak-free connection of guard columns or retention gaps



Agilent Certified Vials, page 18

Agilent HP-1ms Low-Bleed

- ➔ 100% Dimethylpolysiloxane
- ➔ Identical selectivity to HP-1
- ➔ Non-polar
- ➔ Low bleed characteristics
- ➔ Excellent general purpose column
- ➔ Improved signal-to-noise ratio for better sensitivity and mass spectral integrity
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable



Similar Phases: Rtx-1ms, Rxi-1ms, MDN-1, AT-1, ZB-1ms, Equity-1

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	5975T LTM TOROID
0.18	20	0.18	-60 to 325/350	19091S-677	—	19091S-677LTM	29091S-677LTM
0.20	25	0.33	-60 to 325/350	19091S-602	19091S-602E	—	—
0.25	15	0.25	-60 to 325/350	19091S-931	—	—	29091S-931LTM
		0.10	-60 to 325/350	19091S-833	—	19091S-833LTM	29091S-833LTM
	0.25	-60 to 325/350	19091S-933	19091S-933E	19091S-933LTM	—	
	0.50	-60 to 325/350	19091S-633	—	—	—	
	1.00	-60 to 325/350	19091S-733	19091S-733E	19091S-733LTM	—	
0.32	15	0.25	-60 to 325/350	19091S-911	—	—	—
		0.52	-60 to 325/350	19091S-612	—	—	—
	30	0.25	-60 to 325/350	19091S-913	19091S-913E	—	—
		1.00	-60 to 325/350	19091S-713	—	19091S-713LTM	—
	60	0.25	-60 to 325/350	19091S-916	—	—	—

HP-1ms Ultra Inert

Similar Phases: SPB-1, Rtx-1, BP-1, OV-1, OV-101, 007-1(MS), SP-2100, SE-30, ZB-1, AT-1, MDN-1, ZB-1, ZB-1ms

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	INTUVO
0.18	20	0.18	-60 to 325/350	19091S-677UI	—	—
0.25	15	0.25	-60 to 325/350	19091S-931UI	19091S-931UIE	—
		0.25	-60 to 325/350	19091S-933UI	—	19091S-933UI-INT
	0.50	-60 to 325/350	19091S-633UI	—	—	
	1.00	-60 to 325/350	19091S-733UI	—	—	
0.32	15	0.25	-60 to 325/350	19091S-911UI	—	19091S-911UI-INT
		0.52	-60 to 325/350	19091S-612UI	—	—
	30	0.25	-60 to 325/350	19091S-913UI	—	19091S-913UI-INT
		1.00	-60 to 325/350	19091S-713UI	—	—



Intuvo columns for the Agilent Intuvo GC include smart keys which enable immediate identification of the column configuration, temperature limits, and monitors usage.



CHROM TECH RELATED PRODUCTS



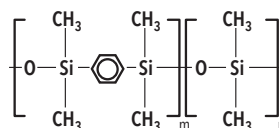
Agilent Gas Clean Filters, page 395



Agilent ADM Flowmeter, page 392

Agilent DB-5ms Low-Bleed

- ➔ Phenyl Arylene polymer virtually equivalent to a (5% Phenyl) methylpolysiloxane
- ➔ Non-polar
- ➔ Very low bleed characteristics, ideal for GC/MS
- ➔ Excellent inertness for active compounds
- ➔ Improved signal-to-noise ratio for better sensitivity and mass spectral integrity
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Extract replacement of HP-5TA
- ➔ Close equivalent to USP Phase G27



200-0185
Test mix



Similar Phases: Rtx-5ms, Rxi-5ms, Rxi-5Sil MS, PTE-5, BPX-5, AT-5ms, ZB-5ms, ZB-5MSi, SLB-5ms, Equity-5

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	5975T LTM TOROID	INTUVO	
0.18	20	0.18	-60 to 325/350	121-5522	121-5522E	121-5522LTM	221-5522LTM	—	
		0.36	-60 to 325/350	121-5523	—	121-5523LTM	—	—	
	40	0.18	-60 to 325/350	121-5542	—	—	—	—	
0.20	12	0.33	-60 to 325/350	128-5512	—	—	—	—	
	25	0.33	-60 to 325/350	128-5522	—	—	—	—	
	50	0.33	-60 to 325/350	128-5552	—	—	—	—	
0.25	15	0.10	-60 to 325/350	122-5511	—	122-5511LTM	—	—	
		0.25	-60 to 325/350	122-5512	—	122-5512LTM	222-5512LTM	—	
		0.50	-60 to 325/350	122-5516	—	—	—	—	
		1.00	-60 to 325/350	122-5513	—	—	—	—	
	25	0.25	-60 to 325/350	122-5522	—	—	—	—	
	30	0.10	-60 to 325/350	122-5531	—	—	—	—	—
		0.25	-60 to 325/350	122-5532	122-5532E	122-5532LTM	222-5532LTM	122-5532-INT	
		0.50	-60 to 325/350	122-5536	122-5536E	—	—	—	
		1.00	-60 to 325/350	122-5533	122-5533E	122-5533LTM	—	—	
	50	0.25	-60 to 325/350	122-5552	—	—	—	—	
	60	0.10	-60 to 325/350	122-5561	—	—	—	—	
		0.25	-60 to 325/350	122-5562	122-5562E	—	—	—	
1.00		-60 to 325/350	122-5563	—	—	—	—		
0.32	15	0.10	-60 to 325/350	123-5511	—	—	—	—	
		0.25	-60 to 325/350	123-5512	—	123-5512LTM	—	—	
		1.00	-60 to 325/350	123-5513	—	—	—	—	
	25	0.52	-60 to 325/350	123-5526	—	—	—	—	
	30	0.10	-60 to 325/350	123-5531	—	—	—	—	
		0.25	-60 to 325/350	123-5532	123-5532E	—	—	—	
		0.50	-60 to 325/350	123-5536	—	123-5536LTM	—	—	
		1.00	-60 to 325/350	123-5533	—	—	—	—	
	60	0.10	-60 to 325/350	123-5561	—	—	—	—	
		0.25	-60 to 325/350	123-5562	—	—	—	—	
		0.50	-60 to 325/350	123-5566	—	—	—	—	
		1.00	-60 to 325/350	123-5563	—	—	—	—	
0.53	15	1.50	-60 to 300/320	125-5512	—	—	—	—	
	30	0.50	-60 to 300/320	125-5537	—	—	—	—	
		1.00	-60 to 300/320	125-553J	—	125-553JLTM	—	—	
		1.50	-60 to 300/320	125-5532	—	—	—	—	

Agilent DB-5ms Low-Bleed (cont.)

DB-5ms Ultra Inert

Similar Phases: Rtx-5ms, Rxi-5ms, Rxi-5Sil MS, VF-5ms, PTE-5, BPX-5, AT-5ms, ZB-5ms, ZB-5MSi, SLB-5ms, Equity-5

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	INTUVO
0.18	20	0.18	-60 to 325/350	121-5522UI	—	121-5522UILTM	121-5522UI-INT
		0.36	-60 to 325/350	121-5523UI	—	121-5523UILTM	121-5523UI-INT
0.25	15	0.25	-60 to 325/350	122-5512UI	—	122-5512UILTM	122-5512UI-INT
		1.00	-60 to 325/350	122-5513UI	—	—	—
	25	0.25	-60 to 325/350	122-5522UI	—	122-5522UILTM	—
	30	0.25	-60 to 325/350	122-5532UI	122-5532UIE	122-5532UILTM	122-5532UI-INT
		0.50	-60 to 325/350	122-5536UI	—	—	122-5536UI-INT
		1.00	-60 to 325/350	122-5533UI	122-5533UIE	—	—
	50	0.25	-60 to 325/350	122-5552UI	—	—	—
	60	0.25	-60 to 325/350	122-5562UI	—	—	122-5562UI-INT
1.00		-60 to 325/350	122-5563UI	—	—	—	
0.32	30	0.25	-60 to 325/350	123-5532UI	123-5532UIE	—	123-5532UI-INT
		0.50	-60 to 325/350	123-5536UI	—	—	—
	60	1.00	-60 to 325/350	123-5533UI	—	—	—
	60	1.00	-60 to 325/350	123-5563UI	—	—	—

Agilent J&W LTM Column Modules for 7890 and 6890 Series GC Systems

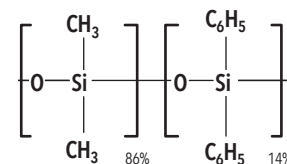
- ➔ LTM II technology is available for Agilent's popular 7890 and 6890 Series GC systems
- ➔ The capacity to run up to four column modules simultaneously— with four different temperature programs—to maximize your productivity
- ➔ Rapid temperature programming rates for higher analysis speeds
- ➔ Faster heating and cooling times—as low as one minute or less— for more rapid analytical cycle times and less downtime
- ➔ Excellent retention time repeatability and performance comparable to conventional GC
- ➔ Less power consumption
- ➔ Integrated module design to facilitate easy column module change



Intuvo columns for the Agilent Intuvo GC include smart keys which enable immediate identification of the column configuration, temperature limits, and monitors usage.

Agilent HP-5ms Low-Bleed

- ➔ (5%-Phenyl)-methylpolysiloxane
- ➔ Identical selectivity to HP-5
- ➔ Non-polar
- ➔ Very low bleed characteristics, ideal for GC/MS
- ➔ Excellent inertness for active compounds including acidic and basic compounds
- ➔ Improved signal-to-noise ratio for better sensitivity and mass spectral integrity
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Equivalent to USP Phase G27



Similar Phases: Rtx-5ms, Rxi-5ms, Rxi-5Sil MS, PTE-5, BPX-5, AT-5ms, ZB-5ms, SLB-5ms, Equity-5

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS ($^{\circ}\text{C}$)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	5975T LTM TOROID	INTUVO
0.18	20	0.18	-60 to 325/350	19091S-577	—	19091S-577LTM	—	—
0.20	12	0.33	-60 to 325/350	19091S-101	—	—	—	—
	25	0.33	-60 to 325/350	19091S-102	19091S-102E	19091S-102LTM	—	—
	50	0.33	-60 to 325/350	19091S-105	—	—	—	—
0.25	15	0.10	-60 to 325/350	19091S-331	—	19091S-331LTM	—	—
		0.25	-60 to 325/350	19091S-431	—	19091S-431LTM	—	—
		1.00	-60 to 325/350	19091S-231	—	—	—	—
	30	0.10	-60 to 325/350	19091S-333	—	—	—	—
		0.25	-60 to 325/350	19091S-433	19091S-433E	19091S-433LTM	29091S-433LTM	19091S-433-INT
		0.50	-60 to 325/350	19091S-133	—	—	—	—
		1.00	-60 to 325/350	19091S-233	19091S-233E	—	—	—
60	0.10	-60 to 325/350	19091S-336	—	—	—	—	
	0.25	-60 to 325/350	19091S-436	19091S-436E	—	—	—	
0.32	25	0.52	-60 to 325/350	19091S-112	19091S-112E	—	—	—
	30	0.10	-60 to 325/350	19091S-313	—	—	—	—
		0.25	-60 to 325/350	19091S-413	19091S-413E	19091S-413LTM	—	—
		0.50	-60 to 325/350	19091S-113	—	—	—	—
		1.00	-60 to 325/350	19091S-213	—	—	—	—
60	0.25	-60 to 325/350	19091S-416	—	—	—	—	

HP-5ms Ultra Inert

Similar Phases: Rtx-5ms, Rxi-5ms, Rxi-5Sil MS, PTE-5, BPX-5, AT-5ms, ZB-5ms, SLB-5ms, Equity-7

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS ($^{\circ}\text{C}$)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	INTUVO
0.18	20	0.18	-60 to 325/350	19091S-577UI	—	19091S-577UILTM	—
0.25	5	0.25	-60 to 325/350	—	—	—	19091S-430UI-INT*
	15	0.25	-60 to 325/350	19091S-431UI	—	19091S-431UILTM	19091S-431UI-INT
	30	0.25	-60 to 325/350	19091S-433UI	19091S-433UIE	19091S-433UILTM	19091S-433UI-INT
		0.50	-60 to 325/350	19091S-133UI	—	—	19091S-133UI-INT
		1.00	-60 to 325/350	19091S-233UI	—	—	—
60	0.25	-60 to 325/350	19091S-436UI	—	—	19091S-436UI-INT	
0.32	30	0.25	-60 to 325/350	19091S-413UI	—	19091S-413UILTM	19091S-413UI-INT
		1.00	-60 to 325/350	19091S-213UI	—	19091S-213UILTM	—

*This configuration is ideal for mid-column backflush applications

Agilent DB-XLB Low-Bleed

- ➔ Exceptionally low bleed
- ➔ Low polarity
- ➔ Extended temperature limit of 340/360 °C
- ➔ Unique selectivity
- ➔ Excellent inertness for active compounds
- ➔ Ideal for confirmational analyses
- ➔ Excellent for pesticides, herbicides, PCBs and PAHs
- ➔ Ideal for GC/MS
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable

Similar Phases: Rtx-XLB, MDN-12, ZB-XLB, ZB-XLB HT

Note: "DB-XLB is designed for inhibiting column bleed at high temperatures. It also appears to have inadvertently inherited an exceptional ability for separating many PCB congeners when used with MS detection. This stellar performance was maximized after careful optimization of the column dimensions, temperature programs, and carrier gas flow conditions."

(Frame, G. Analytical Chemistry News & Features, Aug. 1, 1997, 468A-475A)

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	7890/6890 LTM MODULE
0.18	20	0.18	30 to 340/360	121-1222	—
	30	0.18	30 to 340/360	121-1232	—
0.20	25	0.33	30 to 340/360	128-1222	—
0.25	15	0.10	30 to 340/360	122-1211	—
		0.25	30 to 340/360	122-1212	—
	30	0.10	30 to 340/360	122-1231	—
		0.25	30 to 340/360	122-1232	122-1232LTM
		0.50	30 to 340/360	122-1236	—
	60	1.00	30 to 340/360	122-1233	—
60	0.25	30 to 340/360	122-1262	—	
0.32	30	0.25	30 to 340/360	123-1232	—
		0.50	30 to 340/360	123-1236	—
	60	0.25	30 to 340/360	123-1262	—
0.53	15	1.50	30 to 320/340	125-1212	—
	30	1.50	30 to 320/340	125-1232	—

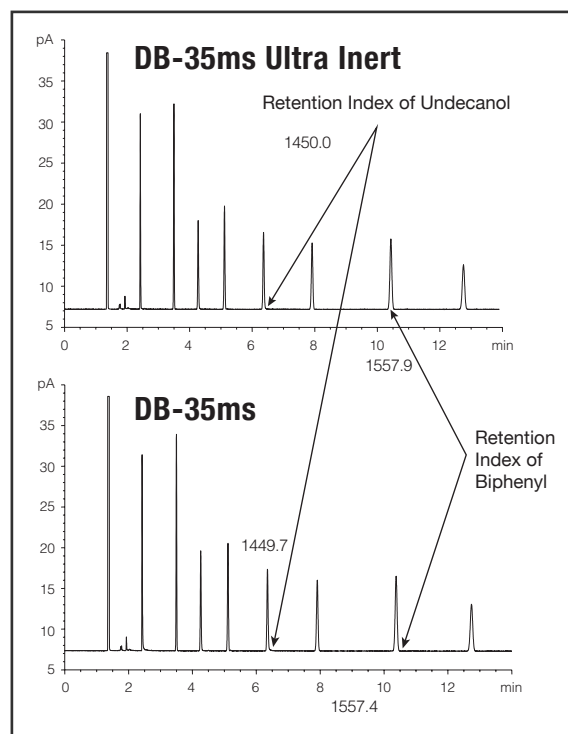
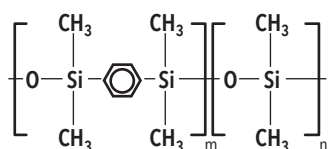
Agilent J&W LTM Column Modules for 7890 and 6890 Series GC Systems

- ➔ LTM II technology is available for Agilent's popular 7890 and 6890 Series GC systems
- ➔ The capacity to run up to four column modules simultaneously—with four different temperature programs—to maximize your productivity
- ➔ Rapid temperature programming rates for higher analysis speeds
- ➔ Faster heating and cooling times—as low as one minute or less—for more rapid analytical cycle times and less downtime
- ➔ Excellent retention time repeatability and performance comparable to conventional GC
- ➔ Less power consumption
- ➔ Integrated module design to facilitate easy column module change



Agilent DB-35ms Low-Bleed

- ➔ Virtually equivalent to a (35%-Phenyl)-methylpolysiloxane
- ➔ Mid-polarity
- ➔ Very low bleed characteristics, ideal for GC/MS
- ➔ Extended temperature limit of 340/360 °C
- ➔ Excellent inertness for active compounds
- ➔ Ideal for confirmational analyses
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Replaces HP-35ms
- ➔ Close equivalent to USP Phase G42



Similar Phases: Rtx-35, Rtx-35ms, Rxi-35Sil MS, SPB-35, AT-35, Sup-Herb, MDN-35, BPX-34, ZB-35, ZB-35 ht

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	5975T LTM TOROID
0.18	20	0.18	50 to 340/360	121-3822	—	—	221-3822LTM
0.20	15	0.33	50 to 340/360	128-3812	—	—	—
	25	0.33	50 to 340/360	128-3822	—	—	—
0.25	15	0.25	50 to 340/360	122-3812	—	—	222-3812LTM
	30	0.15	50 to 340/360	122-3831	—	—	—
		0.25	50 to 340/360	122-3832	122-3832E	122-3832LTM	222-3832LTM
60	0.25	50 to 340/360	122-3862	—	—	—	
0.32	15	0.25	50 to 340/360	123-3812	—	—	—
	30	0.25	50 to 340/360	123-3832	123-3832E	—	—
0.53	30	0.50	50 to 320/340	125-3837	—	—	—
		1.00	50 to 320/340	125-3832	—	—	—

DB-35ms Ultra Inert

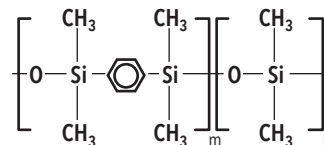
Similar Phases: Rtx-35, Rtx-35ms, Rxi-35Sil MS, SPB-35, AT-35, Sup-Herb, MDN-35, BPX-34, ZB-35, ZB-35 ht

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	INTUVO
0.18	20	0.18	50 to 340/360	121-3822UI	—
0.25	15	0.25	50 to 340/360	122-3812UI	122-3812UI-INT
	30	0.25	50 to 340/360	122-3832UI	122-3832UI-INT
0.32	30	0.25	50 to 340/360	123-3832UI	123-3832UI-INT

Intuvo columns for the Agilent Intuvo GC include smart keys which enable immediate identification of the column configuration, temperature limits, and monitors usage.

Agilent DB-17ms Low-Bleed

- Virtually equivalent to a (50%-Phenyl)-methylpolysiloxane
- 320/340 °C upper temperature limit
- Very low bleed mid-polarity column, ideal for GC/MS
- Excellent inertness for active compounds
- Enhanced mass spectral integrity
- Bonded and cross-linked—Solvent rinsable
- Excellent choice for CLP pesticides



Similar Phases: Rxi-17Sil MS, Rtx-50, 007-17, SP-2250, SPB-50, BPX-50, SPB-17, AT-50

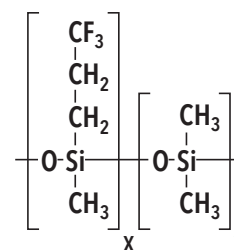
ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	5975T LTM TOROID	INTUVO
0.18	20	0.18	40 to 320/340	121-4722	—	121-4722LTM	221-4722LTM	—
0.25	15	0.15	40 to 320/340	122-4711	—	—	—	—
		0.25	40 to 320/340	122-4712	—	122-4712LTM	222-4712LTM	—
	30	0.15	40 to 320/340	122-4731	—	—	—	—
		0.25	40 to 320/340	122-4732	122-4732E	122-4732LTM	222-4732LTM	122-4732-INT
60	0.25	40 to 320/340	122-4762	—	—	—	—	
0.32	15	0.25	40 to 320/340	123-4712	—	—	—	—
	30	0.25	40 to 320/340	123-4732	—	—	—	123-4732-INT

Agilent VF-200ms Low-Bleed

- Ideally suited for analyses of ketones, aldehydes, nitro- or chloro-containing compounds, PAHs, unsaturated compounds, silanes, and CFCs
- Optimized deactivation for symmetrical peak shape
- Ultra-low bleed for trace analysis

Similar Phases: Rtx-200

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.15	10	0.15	0 to 325/350	CP5893	—
		0.60	0 to 325/350	CP5892	—
	20	0.15	0 to 325/350	CP5891	—
0.25	15	0.25	0 to 325/350	CP8855	CP8855I5
		0.50	0 to 325/350	CP8856	—
		1.00	0 to 325/350	CP8860	CP8860I5
	30	0.10	0 to 325/350	CP8857	—
		0.25	0 to 325/350	CP8858	—
		0.50	0 to 325/350	CP8859	CP8859I5
		1.00	0 to 325/350	CP8861	—
60	0.25	0 to 325/350	CP8861	—	
0.32	15	0.25	0 to 325/350	CP8862	—
	30	0.25	0 to 325/350	CP8863	—
		0.50	0 to 325/350	CP8864	—
		1.00	0 to 325/350	CP8865	xCP8865I5
0.53	15	1.00	0 to 300/325	CP8866	—
		0.50	0 to 300/325	CP8867	—
	30	1.00	0 to 300/325	CP8868	CP8868I5



Agilent DB-225ms

- ➔ Virtually equivalent to a (50%-Cyanopropylphenyl)-methylpolysiloxane
- ➔ Mid/high polarity
- ➔ Excellent for separations of cis- and trans-fatty acid methyl esters (FAMES)
- ➔ Low bleed
- ➔ Bonded and cross-linked—Solvent rinsable
- ➔ Close equivalent for USP Phase G7

Similar Phases: SP-2330, Rtx-225, BP-225, OV-225, 007-225, AT-225

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	5975T LTM TOROID
0.25	15	0.25	40 to 240	122-2912	—	222-2912LTM
	30	0.25	40 to 240	122-2932	122-2932E	222-2932LTM
	60	0.25	40 to 240	122-2962	—	—
0.32	30	0.25	40 to 240	123-2932	—	—

Agilent DB-624 Ultra Inert

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	INTUVO
0.18	20	1.00	-20 to 260	121-1324UI	121-1324UI-INT
0.25	30	1.40	-20 to 260	122-1334UI	122-1334UI-INT
	60	1.40	-20 to 260	122-1364UI	122-1364UI-INT
0.32	30	1.80	-20 to 260	123-1334UI	123-1334UI-INT
	60	1.80	-20 to 260	123-1364UI	123-1364UI-INT
0.53	75	3.00	-20 to 260	125-1374UI	—

- ➔ Excellent for U.S. EPA Methods: 501.3, 502.2, 503.1, 524.2, 601, 602, 8010, 8015, 8020, 8240, and 8260
- ➔ Identical selectivity to the industry standard DB-624 – upgrade with no change in method required

DB-Select 624 UI for 467

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE
0.25	30	1.4	-40 to 280/300	122-0334UI
	60	1.4	-40 to 280/300	122-0364UI
0.32	30	1.4	-40 to 280/300	123-0334UI
	60	1.4	-40 to 280/300	123-0364UI

- ➔ Application Specific UI column—Pharmaceutical residual solvents USP 467

Agilent DB-UI 8270D Ultra Inert

Agilent J&W DB-UI 8270D delivers excellent peak shape for active semivolatile organic compounds targeted by EPA method 8270D, for environmental trace-level analysis with the utmost confidence. Agilent's leading-edge manufacturing process, combined with optimized chemistries and design advancements, improve both inertness and column-to-column reproducibility with no trade-offs in bleed or stationary phase selectivity. All DB-UI 8270D Ultra Inert columns are individually tested with the most highly probative semivolatile compounds – such as propanoic acid, pyridine, 1,2 butanediol, 1-chloro-2-fluorobenzene, and m/p xylene at low temperature (45 °C), to ensure excellent peak shape performance at low levels of 5 – 10 ng on-column.



ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	INTUVO
0.18	20	0.36	-30 to 325/350	121-9723	121-9723-INT
0.25	30	0.25	-60 to 325/350	122-9732	122-9732-INT
		0.50	-60 to 325/350	122-9736	122-9736-INT

Intuvo columns for the Agilent Intuvo GC include smart keys which enable immediate identification of the column configuration, temperature limits, and monitors usage.

Agilent J&W Premium Polysiloxane Columns

Polysiloxanes are the most common stationary phases. They are available in the greatest variety and are stable, robust and versatile. Standard polysiloxanes are characterized by the repeating siloxane backbone. Each silicon atom contains two functional groups. The type and percent level of substitution of the groups distinguish each stationary phase and its properties.

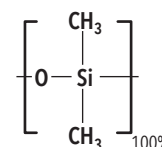


Agilent DB-1

Similar Phases: SPB-1, Rtx-1, BP-1, OV-1, OV-101, 007-1(MS), SP-2100, SE-30, ZB-1, AT-1, MDN-1, ZB-1

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.05	10	0.05	-60 to 325/350	126-1012	—	—
		0.20	-60 to 325/350	126-1013	—	—
0.10	15	0.25	-60 to 325/350	127-100A	—	127-100ALTM
		0.10	-60 to 325/350	127-1012	127-1012E	—
	20	0.40	-60 to 325/350	127-1013	127-1013E	127-1013LTM
		0.10	-60 to 325/350	127-1022	127-1022E	—
	40	0.40	-60 to 325/350	127-1023	127-1023E	—
		0.20	-60 to 325/350	127-1046	127-1046E	—
0.15	10	0.40	-60 to 325/350	127-1043	—	—
		1.20	-60 to 325/350	12A-1015	—	12A-1015LTM
0.18	10	0.18	-60 to 325/350	121-1012	121-1012E	121-1012LTM
		0.20	-60 to 325/350	121-101A	—	121-101ALTM
		0.40	-60 to 325/350	121-1013	—	121-1013LTM
	20	0.18	-60 to 325/350	121-1022	121-1022E	—
		0.40	-60 to 325/350	121-1023	—	121-1023LTM
	40	0.40	-60 to 325/350	121-1043	121-1043E	—
0.20	12	0.33	-60 to 325/350	128-1012	—	—
	25	0.33	-60 to 325/350	128-1022	—	—
	30	0.80	-60 to 325/350	128-1034	—	—
	50	0.33	-60 to 325/350	128-1052	—	—
0.25	15	0.10	-60 to 325/350	122-1011	—	—
		0.25	-60 to 325/350	122-1012	—	122-1012LTM
		1.00	-60 to 325/350	122-1013	—	—
	25	0.25	-60 to 325/350	122-1022	—	—
	30	0.10	-60 to 325/350	122-1031	—	—
		0.25	-60 to 325/350	122-1032	122-1032E	122-1032LTM
		0.50	-60 to 325/350	122-103E	—	—
	50	1.00	-60 to 325/350	122-1033	122-1033E	122-1033LTM
		0.25	-60 to 325/350	122-1052	—	—
		60	0.10	-60 to 325/350	122-1061	—
	60	0.25	-60 to 325/350	122-1062	—	—
		0.50	-60 to 325/350	122-106E	—	—
1.00		-60 to 325/350	122-1063	—	—	
100	0.50	-60 to 325/350	122-10AE	—	—	
150	1.00	-60 to 325/350	122-10G3	—	—	

(Continued)



- ➔ 100% Dimethylpolysiloxane
- ➔ Non-polar
- ➔ Excellent general purpose column
- ➔ Wide range of applications
- ➔ Low bleed
- ➔ High temperature limit
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Wide range of column dimensions available
- ➔ Equivalent to USP Phase G2

CHROM TECH RELATED PRODUCTS

PART NO	TEST MIX FOR DB-1
200-0010	0.05 & 0.10 mm ID
200-0310	0.18 & 0.32 mm ID
200-0110	0.45 & 0.53 mm ID

Compare your column's performance to the test chromatogram shipped with your Agilent J&W column. The column test standard contains components that test the column for resolution characteristics, efficiency, and inertness. The test mixes are supplied at a concentration of 250 ng/µL in 2 mL vials. Match the column diameter to find the test mix for your column.

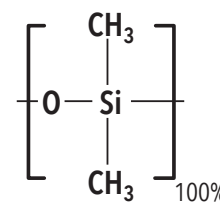


ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	INTUVO	
0.32	5	0.33	-60 to 325/350	—	—	—	123-100A-INT	
	15	0.10	-60 to 325/350	123-1011	—	—	—	
		0.25	-60 to 325/350	123-1012	—	123-1012LTM	—	
		1.00	-60 to 325/350	123-1013	—	—	—	
		3.00	-60 to 280/300	123-1014	—	—	—	
		5.00	-60 to 280/300	123-1015	—	123-1015LTM	—	
	25	0.12	-60 to 325/350	123-1027	—	—	—	
		0.25	-60 to 325/350	123-1022	—	—	—	
		0.52	-60 to 325/350	123-1026	—	—	—	
		1.05	-60 to 325/350	123-102F	—	—	—	
	30	0.10	-60 to 325/350	123-1031	—	—	—	
		0.25	-60 to 325/350	123-1032	—	123-1032LTM	—	
		0.50	-60 to 325/350	123-103E	—	123-103ELTM	—	
		1.00	-60 to 325/350	123-1033	123-1033E	123-1033LTM	123-1033-INT	
		1.50	-60 to 300/320	123-103B	—	123-103BLTM	—	
		3.00	-60 to 280/300	123-1034	—	—	—	
		5.00	-60 to 280/300	123-1035	—	123-1035LTM	—	
	50	0.25	-60 to 325/350	123-1052	—	—	—	
		0.52	-60 to 325/350	123-1056	—	—	—	
		1.05	-60 to 325/350	123-105F	—	—	—	
		1.20	-60 to 325/350	123-105C	—	—	—	
		5.00	-60 to 280/300	123-1055	—	—	—	
	60	0.10	-60 to 325/350	123-1061	—	—	—	
		0.25	-60 to 325/350	123-1062	123-1062E	—	—	
		0.50	-60 to 325/350	123-106E	—	—	—	
		1.00	-60 to 325/350	123-1063	123-1063E	—	—	
		1.50	-60 to 300/320	123-106B	123-106BE	—	—	
		2.00	-60 to 280/300	123-106G	—	—	—	
		3.00	-60 to 280/300	123-1064	123-1064E	—	—	
		5.00	-60 to 280/300	123-1065	123-1065E	—	—	
	0.45	30	1.27	-60 to 325/350	124-1032	—	—	—
			2.55	-60 to 260/280	124-1034	—	—	—
0.53	5	2.65	-60 to 325/350	125-100B	—	—	—	
		5.00	-60 to 325/350	125-1005	—	125-1005LTM	—	
	7.5	1.50	-60 to 325/350	125-1002	—	—	—	
	10	2.65	-60 to 260/280	125-10HB	125-10HBE	—	—	
		5.00	-60 to 260/280	125-10H5	—	—	—	
	15	0.15	-60 to 340/360	125-1011	125-1011E	—	—	
		0.25	-60 to 320/340	125-101K	—	—	—	
		0.50	-60 to 300/320	125-1017	—	—	—	
		1.00	-60 to 300/320	125-101J	—	—	—	
		1.50	-60 to 300/320	125-1012	125-1012E	125-1012LTM	—	
		3.00	-60 to 260/280	125-1014	—	—	—	
		5.00	-60 to 260/280	125-1015	—	—	—	
	25	1.00	-60 to 300/320	125-102J	—	—	—	
5.00		-60 to 260/280	125-1025	—	—	—		

(Continued)

Agilent DB-1 (cont.)

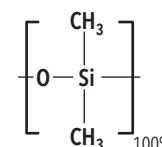
ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.53	30	0.10	-60 to 340/360	125-1039	—	—
		0.25	-60 to 320-340	125-103K	125-103KE	—
		0.50	-60 to 300/320	125-1037	—	—
		1.00	-60 to 300/320	125-103J	—	125-103JLTM
		1.50	-60 to 300/320	125-1032	—	125-1032LTM
		2.65	-60 to 260/280	125-103B	—	—
		3.00	-60 to 260/280	125-1034	125-1034E	125-1034LTM
		5.00	-60 to 260/280	125-1035	125-1035E	125-1035LTM
50	5.00	-60 to 260/280	125-1035	125-1035E	125-1035LTM	
60	1.00	1.00	-60 to 300/320	125-106J	125-106JE	—
		1.50	-60 to 300/320	125-1062	125-1062E	—
		3.00	-60 to 260/280	125-1064	—	—
		5.00	-60 to 260/280	125-1065	125-1065E	—
105	5.00	-60 to 260/280	125-10B5	—	—	



Agilent J&W LTM Column Modules for 7890 and 6890 Series GC Systems

Agilent HP-1

- ➔ 100% Dimethylpolysiloxane
- ➔ Non-polar
- ➔ Excellent general purpose column— "Industry Standard"
- ➔ Wide range of applications
- ➔ Superior performance for low molecule weight alcohols (<C5)
- ➔ High temperature limit
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Wide range of column dimensions available
- ➔ Equivalent to USP Phase G2



Similar Phases: SPB-1, Rtx-1, BP-1, OV-1, OV-101, 007-1(MS), SP-2100, SE-30, ZB-1, AT-1, MDN-1, ZB-1

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.18	20	0.18	-60 to 325/350	19091Z-577	19091Z-577E	—
0.20	12	0.33	-60 to 325/350	19091Z-60312	—	—
		0.11	-60 to 325/350	19091Z-002	—	—
	25	0.11	-60 to 325/350	19091Z-002	—	—
		0.33	-60 to 325/350	19091Z-102	19091Z-102E	—
		0.50	-60 to 325/350	19091Z-202	—	19091Z-202LTM
50	0.11	0.11	-60 to 325/350	19091Z-005	—	—
		0.33	-60 to 325/350	19091Z-105	—	—
		0.50	-60 to 325/350	19091Z-205	—	—

(Continued)

CHROM TECH RELATED PRODUCTS

PART NO	TEST MIX FOR HP-1
5080-8858	0.18 & 0.32 mm ID
8500-6812	0.45 & 0.53 mm ID

Compare your column's performance to the test chromatogram shipped with your Agilent J&W column. The column test standard contains components that test the column for resolution characteristics, efficiency, and inertness. The test mixes are supplied at a concentration of 250 ng/µL in 2 mL vials. Match the column diameter to find the test mix for your column.

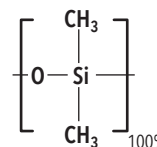


Agilent HP-1 (cont.)

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	INTUVO	
0.25	15	0.10	-60 to 325/350	19091Z-331	—	—	—	
		0.25	-60 to 325/350	19091Z-431	—	—	—	
		1.00	-60 to 325/350	19091Z-231	—	—	—	
	30	0.10	-60 to 325/350	19091Z-333	—	—	—	
		0.25	-60 to 325/350	19091Z-433	19091Z-433E	—	—	
		1.00	-60 to 325/350	19091Z-233	19091Z-233E	—	—	
	60	0.25	-60 to 325/350	19091Z-436	—	—	—	
		1.00	-60 to 325/350	19091Z-236	19091Z-236E	—	—	
	100	0.50	-60 to 325/350	19091Z-530	19091Z-530E	—	—	
0.32	15	0.25	-60 to 325/350	19091Z-411	19091Z-411E	—	—	
		1.00	-60 to 325/350	19091Z-211	—	—	—	
	25	0.17	-60 to 325/350	19091Z-012	—	19091Z-012LTM	—	
		0.52	-60 to 325/350	19091Z-112	19091Z-112E	—	—	
		1.05	-60 to 325/350	19091Z-212	—	—	—	
	30	4.0	-60 to 325/350	—	—	—	19091Z-613-INT	
	30	0.10	-60 to 325/350	19091Z-313	—	19091Z-313LTM	—	
		0.25	-60 to 325/350	19091Z-413	19091Z-413E	—	—	
		1.00	-60 to 325/350	19091Z-313	19091Z-213E	—	—	
		3.00	-60 to 260/280	19091Z-513	19091Z-513E	—	—	
		4.00	-60 to 260/280	19091Z-613	—	19091Z-613LTM	—	
		5.00	-60 to 260/280	19091Z-713	19091Z-713E	19091Z-713LTM	—	
	50	0.17	-60 to 325/350	19091Z-015	—	—	—	
		0.52	-60 to 325/350	19091Z-115	19091Z-115E	—	—	
		1.05	-60 to 325/350	19091Z-215	—	—	—	
	60	0.25	-60 to 325/350	19091Z-416	—	—	—	
		1.00	-60 to 325/350	19091Z-216	19091Z-216E	—	—	
		5.00	-60 to 260/280	19091Z-716	—	—	—	
	0.53	5	0.15	-60 to 230/400	19095Z-220	—	—	—
			0.88	-60 to 230/400	19095Z-020	—	—	—
				-60 to 325/350	125-100A	—	—	—
2.65			-60 to 260/280	19095S-100	19095S-100E	—	—	
7.5		5.00	-60 to 260/280	19095Z-627	19095Z-627E	—	—	
10		0.88	-60 to 300/320	19095Z-021	19095Z-021E	19095Z-021LTM	—	
		2.65	-60 to 260/280	19095Z-121	19095Z-121E	19095Z-121LTM	—	
15		0.15	-60 to 320/400	19095Z-221	19095Z-221E	—	—	
		1.50	-60 to 300/320	19095Z-321	—	19095Z-321LTM	—	
		3.00	-60 to 260/280	19095Z-421	19095Z-421E	—	—	
30		5.00	-60 to 260/280	19095Z-621	—	—	—	
		0.88	-60 to 300/320	19095Z-023	19095Z-023E	19095Z-023LTM	—	
		1.50	-60 to 300/320	19095Z-323	19095Z-323E	—	—	
		2.65	-60 to 260/280	19095Z-123	19095Z-123E	—	—	
		3.00	-60 to 260/280	19095Z-423	19095Z-423E	—	—	
60		5.00	-60 to 260/280	19095Z-623	19095Z-623E	19095Z-623LTM	—	

Agilent CP-Sil 5 CB

- ➔ 100% Dimethylpolysiloxane
- ➔ Non-polar
- ➔ General purpose phase
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Available in Fused Silica or UltiMetal
- ➔ Separation almost entirely based on boiling points, making this column suitable for a wide range of applications with a broad temperature range
- ➔ High temperature limit
- ➔ Supplied with an EZ-GRIP to simplify column installation, coupling and operation



Similar Phases: SPB-1, Rtx-1, BP-1, OV-1, OV-101, 007-1(MS), SP-2100, SE-30, ZB-1, AT-1, MDN-1, ZB-1

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.10	10	0.10	-60 to 330/350	CP7311	—
		0.12	-60 to 330/350	CP7310	—
0.15	10	0.12	-60 to 330/350	CP7684	—
		2.00	-60 to 325/350	CP7682	—
	25	0.12	-60 to 330/350	CP7694	—
		1.20	-60 to 325/350	CP7693	—
		2.00	-60 to 325/350	CP7692	—
0.20	25	0.33	-60 to 325/350	CP7622	—
		0.50	-60 to 325/350	—	CP7644I5
0.25	10	0.12	-60 to 330/350	CP7700	—
		0.25	-60 to 330/350	CP8510	—
	25	0.12	-60 to 330/350	CP7710	—
		0.25	-60 to 330/350	CP7441	—
		0.40	-60 to 325/350	CP7709	—
		1.20	-60 to 325/350	CP7670	CP7670I5
	30	0.10	-60 to 330/350	CP8710	—
		0.25	-60 to 330/350	CP8741	CP8741I5
		1.00	-60 to 325/350	CP8770	—
	50	0.12	-60 to 330/350	CP7720	—
		0.25	-60 to 330/350	CP7443	CP7443I5
		0.40	-60 to 325/350	CP7719	—
	60	0.25	-60 to 330/350	CP8743	—
		1.00	-60 to 325/350	CP8780	—

(Continued)



CHROM TECH RELATED PRODUCTS



Agilent Gas Clean Filters,
page 395



Agilent ADM Flowmeter,
page 392



Agilent Premium Non-Stick Septa,
page 365



Agilent Certified Vials, page 18

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.32	10	0.12	-60 to 330/350	CP7730	—
		1.20	-60 to 325/350	CP7758	—
	15	0.10	-60 to 330/350	CP8529	—
		0.25	-60 to 325/350	CP8530	—
		3.00	-60 to 325/350	CP8550	—
		1.00	-60 to 325/350	CP8540	—
		5.00	-60 to 300/325	CP8560	—
	25	0.12	-60 to 330/350	CP7740	—
		0.25	-60 to 325/350	CP8530	—
		0.40	-60 to 325/350	CP7739	—
		0.52	-60 to 325/350	CP8430	—
		1.20	-60 to 325/350	CP7760	—
		5.00	-60 to 300/325	CP7680	CP7680I5
	30	0.25	-60 to 325/350	CP8742	—
		1.00	-60 to 325/350	CP8760	—
		3.00	-60 to 310/335	CP8687	CP8687I5
		5.00	-60 to 300/325	CP8688	CP8688I5
	50	0.12	-60 to 330/335	CP7750	CP7750I5
		0.25	-60 to 325/350	CP7444	—
		0.40	-60 to 325/350	CP7749	CP7749I5
		1.20	-60 to 325/350	CP7770	CP7770I5
		5.00	-60 to 300/325	CP7690	CP7690I5
	60	0.25	-60 to 325/350	CP8744	—
		1.00	-60 to 325/350	CP8870	—
3.00		-60 to 310/335	CP8689	—	
5.00		-60 to 300/325	CP8690	CP8690I5	
0.53	10	1.00	-60 to 315/340	CP7625	—
		2.00	-60 to 305/330	CP7620	—
		5.00	-60 to 290/325	CP7645	—
	15	0.15	-60 to 330/350	CP8673	—
		1.50	-60 to 305/330	CP8674	—
		3.00	-60 to 300/325	CP8675	—
		5.00	-60 to 290/325	CP8676	—
	20	5.00	-60 to 290/325	CP8774	—
	25	1.00	-60 to 315/340	CP7635	—
		2.00	-60 to 305/330	CP7630	—
		5.00	-60 to 290/325	CP7675	—
	30	1.50	-60 to 305/330	CP8735	CP8735I5
		2.00	-60 to 305/330	CP8730	—
		3.00	-60 to 300/325	CP8677	—
		5.00	-60 to 290/325	CP8775	—
	50	1.00	-60 to 315/340	CP7695	—
		2.00	-60 to 305/330	CP7640	—
		5.00	-60 to 290/325	CP7685	CP7685I5
	60	1.50	-60 to 305/330	CP8799	—
		5.00	-60 to 290/325	CP8685	—
	100	0.50	-60 to 325/350	CP7608	—
		5.00	-60 to 290/325	CP7688	—

Agilent CP-SIL 5 CB UltiMetal

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.20	12	0.33	-60 to 325/350	19091A-101	—	—
		0.11	-60 to 325/350	19091A-008	—	—
	17	0.33	-60 to 325/350	19091A-108	—	—
		0.11	-60 to 325/350	19091A-002	—	—
	25	0.33	-60 to 325/350	19091A-102	19091A-102E	—
		0.11	-60 to 325/350	19091A-005	—	—
0.32	25	0.33	-60 to 325/350	19091A-105	—	—
		0.17	-60 to 325/350	19091A-012	—	—
	50	0.52	-60 to 325/350	19091A-112	—	19091A-112LTM
		0.17	-60 to 325/350	19091A-015	—	—
	50	0.52	-60 to 325/350	19091A-115	—	—
		0.17	-60 to 325/350	19091A-015	—	—



CHROM TECH RELATED PRODUCTS

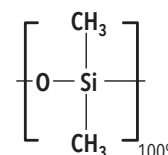


Agilent Premium Non-Stick Septa, page 365

Agilent Ultra 1

Similar Phases: SPB-1, Rtx-1, BP-1, 007-1(MS)

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.20	12	0.33	-60 to 325/350	19091A-101	—	19091A-101LTM
		0.11	-60 to 325/350	19091A-008	—	19091A-008LTM
	17	0.33	-60 to 325/350	19091A-108	—	—
		0.11	-60 to 325/350	19091A-002	—	19091A-002LTM
	25	0.33	-60 to 325/350	19091A-102	19091A-102E	19091A-102LTM
		0.11	-60 to 325/350	19091A-005	—	—
0.32	25	0.33	-60 to 325/350	19091A-105	—	—
		0.17	-60 to 325/350	19091A-012	—	19091A-012LTM
	50	0.52	-60 to 325/350	19091A-112	—	—
		0.17	-60 to 325/350	19091A-015	—	—
	50	0.52	-60 to 325/350	19091A-115	—	—
		0.17	-60 to 325/350	19091A-015	—	—

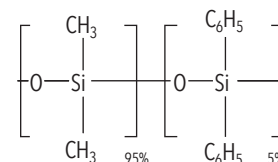


- ➔ 100% Dimethylpolysiloxane
- ➔ Non-polar
- ➔ Equivalent to HP-1 with tighter specifications for retention index and capacity factors
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable

Agilent Ultra 2

Similar Phases: SPB-5, Rtx-5, BP-5, CB-5, 007-5, 2B-5

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.20	12	0.33	-60 to 325/350	19091B-101	—	19091B-101LTM
		0.11	-60 to 325/350	19091B-002	—	—
	25	0.33	-60 to 325/350	19091B-102	19091B-102E	19091B-102LTM
		0.11	-60 to 325/350	19091B-005	—	—
0.32	25	0.33	-60 to 325/350	19091B-105	19091B-105E	—
		0.17	-60 to 325/350	19091B-012	19091B-012E	—
	50	0.52	-60 to 325/350	19091B-112	—	19091B-112LTM
		0.17	-60 to 325/350	19091B-015	—	—
50	0.52	-60 to 325/350	19091B-115	19091B-115E	—	



- ➔ (5%-Phenyl)-methylpolysiloxane
- ➔ Non-polar
- ➔ Equivalent to HP-5 with tighter specifications for retention index and capacity factors
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable

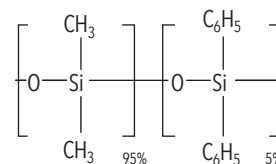
ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	INTUVO
0.32	50	0.52	-60 to 325/350	19091B-115-INT

Agilent DB-5

Similar Phases: SPB-5, Rtx-5, BP-5, OV-5, 007-2(MPS-5), SE-52, SE-54, XTI-5, PTE-5, ZB-5, AT-5, MDN-5, ZB-5

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.10	10	0.10	-60 to 325/350	127-5012	127-5012E	127-5012LTM
		0.17	-60 to 325/350	127-501E	—	—
		0.33	-60 to 325/350	127-501N	—	—
		0.40	-60 to 325/350	127-5013	—	—
	20	0.10	-60 to 325/350	127-5022	127-5022E	—
		0.40	-60 to 325/350	127-5023	—	—
0.15	10	1.20	-60 to 300/320	12A-5015	—	12A-5015LTM
0.18	10	0.18	-60 to 325/350	121-5012	121-5012E	121-5012LTM
		0.40	-60 to 325/350	121-5013	—	121-5013LTM
	20	0.18	-60 to 325/350	121-5022	121-5022E	—
		0.40	-60 to 325/350	121-5023	—	—
		0.18	-60 to 325/350	121-5042	—	—
0.20	12	0.33	-60 to 325/350	128-5012	—	—
	15	0.20	-60 to 325/350	128-50H7	—	—
	25	0.33	-60 to 325/350	128-5022	—	—
	50	0.33	-60 to 325/350	128-5052	—	—
0.25	15	0.10	-60 to 325/350	122-5011	—	—
		0.25	-60 to 325/350	122-5012	—	122-5012LTM
		0.50	-60 to 325/350	122-501E	—	—
		1.00	-60 to 325/350	122-5013	—	—
	25	0.25	-60 to 325/350	122-5022	—	—
	30	0.10	-60 to 325/350	122-5031	—	—
		0.25	-60 to 325/350	122-5032	—	122-5012LTM
		0.50	-60 to 325/350	122-503E	—	122-503ELTM
		1.00	-60 to 325/350	122-5033	122-5033E	122-5033LTM
	50	0.25	-60 to 325/350	122-5052	—	—
	60	0.10	-60 to 325/350	122-5061	—	—
		0.25	-60 to 325/350	122-5062	—	—
		0.50	-60 to 325/350	122-506E	—	—
		1.00	-60 to 325/350	122-5063	—	—
	0.32	10	0.50	-60 to 325/350	123-500E	—
0.10			-60 to 325/350	123-5011	—	123-5011LTM
0.25			-60 to 325/350	123-5012	123-5012E	123-5012LTM
1.00			-60 to 325/350	123-5013	123-5013E	123-5013LTM
25		0.17	-60 to 325/350	123-502D	—	—
		0.25	-60 to 325/350	123-5022	—	—
		0.52	-60 to 325/350	123-5026	—	—
		1.05	-60 to 325/350	123-502F	—	—
		0.10	-60 to 325/350	123-5031	—	—
30		0.25	-60 to 325/350	123-5032	123-5032E	123-5032LTM
		0.50	-60 to 325/350	123-503E	—	123-503ELTM
		1.00	-60 to 325/350	123-5033	123-5033E	—
		1.50	-60 to 325/350	123-503B	—	—

(Continued)



- ➔ (5%-Phenyl)-methylpolysiloxane
- ➔ Non-polar
- ➔ Excellent general purpose column
- ➔ Wide range of applications
- ➔ Low bleed
- ➔ High temperature limit
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Wide range of column dimensions available
- ➔ Equivalent to USP Phase G27



CHROM TECH RELATED PRODUCTS

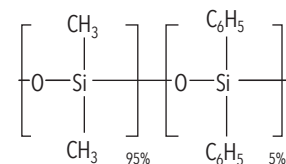
PART NO	TEST MIX FOR DB-5
200-0010	0.05 & 0.10 mm ID
200-0310	0.18 & 0.32 mm ID
200-0110	0.45 & 0.53 mm ID

Compare your column's performance to the test chromatogram shipped with your Agilent J&W column. The column test standard contains components that test the column for resolution characteristics, efficiency, and inertness. The test mixes are supplied at a concentration of 250 ng/μL in 2 mL vials.



Agilent DB-5 (continued)

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.32	50	0.25	-60 to 325/350	123-5052	—	—
		0.52	-60 to 325/350	123-5056	—	—
		1.00	-60 to 325/350	123-5053	—	—
60		0.25	-60 to 325/350	123-5062	—	—
		1.00	-60 to 325/350	123-5063	123-5063E	—
0.45	30	0.42	-60 to 300/320	124-5037	—	—
		1.27	-60 to 300/320	124-5032	—	—
0.53	10	2.65	-60 to 260/280	125-50HB	—	—
	15	0.52	-60 to 300/320	125-501K	—	—
0.50		-60 to 300/320	125-5017	—	—	
1.00		-60 to 300/320	125-501J	—	—	
1.50		-60 to 300/320	125-5012	125-5012E	—	
25		5.00	-60 to 260/280	125-5025	—	—
30	0.25	-30 to 300/320	125-503K	—	—	
		-30 to 300/320	125-5037	—	—	
	0.88	-30 to 300/320	125-503D	—	—	
		-30 to 300/320	125-503D	—	125-503DLTM	
	1.50	-30 to 300/320	125-5032	125-5032E	125-5032LTM	
	2.65	-60 to 300/320	125-5032	125-5032E	125-5032LTM	
	3.00	-60 to 260/280	125-5034	—	—	
	5.00	-60 to 260/280	125-5035	125-5035E	125-5035LTM	
60	1.50	-60 to 300/320	125-5062	—	—	
	5.00	-60 to 260/280	125-5065	125-5065E	—	



CHROM TECH RELATED PRODUCTS



UltiMetal Plus Ultimate Union, page 371
Leak-free connection of guard columns or retention gaps

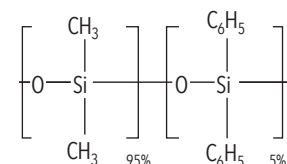


Agilent Certified Vials, page 18

Agilent HP-5

Similar Phases: SPB-5, Rtx-5, BP-5, OV-5, 007-2(MPS-5), SE-52, SE-54, XTI-5, PTE-5, ZB-5, AT-5, MDN-5, ZB-5

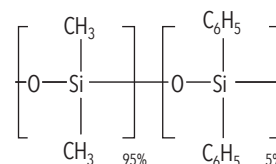
ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.18	20	0.18	-60 to 325/350	19091J-577	19091J-577E	19091J-577LTM
0.20	12	0.33	-60 to 325/350	19091J-101	—	—
		0.33	-60 to 325/350	19091J-108	—	—
	25	0.11	-60 to 325/350	19091J-002	—	—
		0.33	-60 to 325/350	19091J-102	19091J-102E	—
	50	0.50	-60 to 325/350	19091J-202	—	—
		0.11	-60 to 325/350	19091J-005	—	—
0.25	5	0.33	-60 to 325/350	19091J-102	19091J-105E	—
		0.50	-60 to 325/350	19091J-205	—	—
	15	0.10	-60 to 325/350	—	—	19091J-330LTM
		0.25	-60 to 325/350	19091J-431	19091J-431E	—
	30	1.00	-60 to 325/350	19091J-231	—	—
		0.10	-60 to 325/350	19091J-333	—	—
	0.25	-60 to 325/350	19091J-433	19091J-433E	19091J-433LTM	
	1.00	-60 to 325/350	19091J-233	—	19091J-233LTM	



- ➔ (5%-Phenyl)-methylpolysiloxane
- ➔ Non-polar
- ➔ Excellent general purpose column
- ➔ Wide range of applications
- ➔ High temperature limit
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Wide range of column dimensions available
- ➔ Equivalent to USP Phase G27

Agilent HP-5 (cont.)

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.25	60	0.25	-60 to 325/350	19091J-436	19091J-436E	—
		1.00	-60 to 325/350	19091J-236	—	—
0.32	15	0.25	-60 to 325/350	19091J-411	—	19091J-411LTM
		25	0.17	-60 to 325/350	19091J-012	19091J-012E
	30	0.52	-60 to 325/350	19091J-112	19091J-112E	—
		1.05	-60 to 325/350	19091J-212	—	—
		0.10	-60 to 325/350	19091J-313	—	—
		0.25	-60 to 325/350	19091J-413	19091J-413E	19091J-413LTM
		0.50	-60 to 325/350	19091J-113	19091J-113E	19091J-113LTM
		1.00	-60 to 325/350	19091J-213	19091J-213E	—
	50	0.17	-60 to 325/350	19091J-015	—	—
			-60 to 325/350	19091J-115	19091J-115E	—
-60 to 325/350			19091J-215	19091J-215E	—	
60	0.25	-60 to 325/350	19091J-416	—	—	
		-60 to 325/350	19091J-216	19091J-216E	—	
0.53	10	2.65	-60 to 260/280	19095J-121	19095J-121E	19095J-121LTM
	15	1.50	-60 to 300/320	19095J-321	—	—
		0.88	-60 to 300/320	19095J-023	19095J-023E	—
	30	1.50	-60 to 300/320	19095J-323	19095J-323E	—
		2.65	-60 to 260/280	19095J-123	19095J-123E	—
		5.00	-60 to 260/280	19095J-623	19095J-623E	—


CHROM TECH RELATED PRODUCTS

PART NO	TEST MIX FOR HP-5
5080-8858	0.18 & 0.32 mm ID
8500-6812	0.45 & 0.53 mm ID

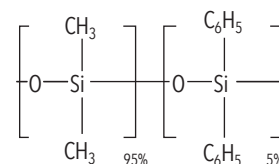
Compare your column's performance to the test chromatogram shipped with your Agilent J&W column. The column test standard contains components that test the column for resolution characteristics, efficiency, and inertness. The test mixes are supplied at a concentration of 250 ng/μL in 2 mL vials. Match the column diameter to find the test mix for your column.

Agilent CP-Sil 8 CB

Similar Phases: SPB-5, Rtx-5, BP-5, OV-5, 007-2(MPS-5), SE-52, SE-54, XTI-5, PTE-5, ZB-5, AT-5, MDN-5, ZB-5

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.15	10	0.12	-60 to 330/350	CP7884	—
0.25	15	0.25	-60 to 330/350	CP8511	—
		1.00	-60 to 325/350	CP8521	—
	25	0.12	-60 to 330/350	CP7711	—
		0.25	-60 to 330/350	CP7451	—
		1.20	-60 to 325/350	CP7671	—
	30	0.25	-60 to 330/350	CP8751	—
		1.00	-60 to 325/350	CP8771	—
	50	0.12	-60 to 330/350	CP7721	—
			-60 to 330/350	CP7453	CP7453I5
		0.40	-60 to 325/350	CP7769	—
60	0.10	-60 to 325/350	CP8750	—	
		-60 to 330/350	CP8753	—	
	1.00	-60 to 325/350	CP8781	—	
0.32	10	0.12	-60 to 330/350	CP7731	—
		5.00	-60 to 300/325	CP8014	—
	15	0.25	-60 to 325/350	CP8531	—
		1.00	-60 to 325/350	CP8541	—

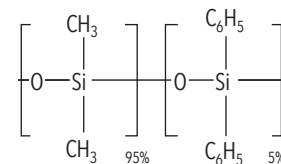
(Continued)



- ➔ (5%-Phenyl)-methylpolysiloxane
- ➔ Non-polar
- ➔ General purpose phase
- ➔ High column-to-column reproducibility
- ➔ Wide choice of dimensions available
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Low bleed
- ➔ Available in Fused Silica and UltiMetal
- ➔ Supplied with an EZ-GRIP to simplify column installation, coupling and operation

Agilent CP-Sil 8 CB (cont.)

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.32	25	0.12	-60 to 330/350	CP7741	CP774115
		0.25	-60 to 325/350	CP7452	—
		0.40	-60 to 325/350	CP7779	—
		0.52	-60 to 325/350	CP8431	—
		1.20	-60 to 325/350	CP7761	—
		5.00	-60 to 325/350	CP7681	—
	30	0.10	-60 to 330/350	CP8791	—
		0.25	-60 to 325/350	CP8752	—
		1.00	-60 to 325/350	CP8761	—
	50	0.12	-60 to 330/350	CP7751	CP775115
		0.25	-60 to 325/350	CP7454	—
		0.40	-60 to 325/350	CP7789	—
		1.20	-60 to 325/350	CP7771	—
		5.00	-60 to 300/325	CP7691	CP769115
60	0.25	-60 to 325/350	CP8754	—	
	1.00	-60 to 325/350	CP8871	—	
0.53	10	2.00	-60 to 305/330	CP7621	—
		5.00	-60 to 290/325	CP7646	—
	15	1.50	-60 to 305/330	CP8678	—
		2.00	-60 to 305/330	CP7631	—
	25	1.00	-60 to 315/340	CP7636	—
		5.00	-60 to 290/325	CP7656	—
		30	0.50	-60 to 325/350	CP8716
	30	1.50	-60 to 305/330	CP8736	CP873615
		5.00	-60 to 290/325	CP8756	—
		50	1.00	-60 to 315/340	CP7696
	50	2.00	-60 to 305/330	CP7641	—
		5.00	-60 to 290/325	CP7666	—
		60	1.50	-60 to 305/330	CP8796
	100	5.00	-60 to 290/325	CP7676	—



Agilent CP-SIL 8 CB UltiMetal

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE
0.53	25	5.00	-60 to 325/350	CP6680
	50	5.00	-60 to 325/350	CP7196



CHROM TECH RELATED PRODUCTS



Agilent Gas Clean Filters,
page 395



Agilent ADM Flowmeter,
page 392

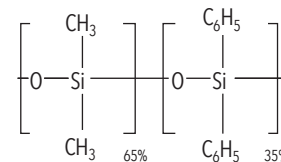


Agilent Premium Non-Stick Septa,
page 365

Agilent HP-35 & DB-35

Similar Phases: Rtx-35, Rtx-35ms, Rxi-35Sil MS, SPB-35, AT-35, Sup-Herb, MDN-35, BPX-34, ZB-35, ZB-35 ht

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	HP-35 7 IN CAGE	DB-35 7 IN CAGE	DB-35 7890/6890 LTM MODULE
0.25	30	0.25	40 to 300/320	19091G-133	122-1932	—
	60	0.25	40 to 300/320	—	122-1962	—
0.32	30	0.25	40 to 300/320	19091G-113	123-1932	122-1932LTM
		0.50	40 to 300/320	19091G-213	123-1933	—
0.53	15	1.00	40 to 280/300	—	125-1912	—
	30	0.50	40 to 280/300	—	125-1937	—
		1.00	40 to 280/300	—	125-1932	125-1932LTM

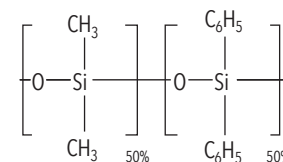


- (35%-Phenyl)-methylpolysiloxane
- Mid polarity — DB-35 slightly more polar than HP-35
- Inert to active solutes
- Equivalent to USP Phase G42

Agilent DB-17

Similar Phases: Rtx-50, 007-17(MPS-50), SP-2250, SPB-50, ZB-50, AT-50

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.10	10	0.10	40 to 280/300	127-1712	—	—
		0.20	40 to 280/300	127-1713	—	—
0.18	20	0.18	40 to 280/300	121-1722	—	121-1722LTM
		0.30	40 to 280/300	121-1723	—	—
0.25	15	0.25	40 to 280/300	122-1712	—	—
		0.50	40 to 280/300	122-1713	122-1713E	—
	30	0.15	40 to 280/300	122-1731	122-1731E	—
		0.25	40 to 280/300	122-1732	122-1732E	122-1732LTM
		0.50	40 to 280/300	122-1733	—	—
60	0.25	40 to 280/300	122-1762	—	—	
	0.50	40 to 280/300	123-1711	—	—	
0.32	15	0.25	40 to 280/300	123-1712	—	—
		0.50	40 to 280/300	123-1713	—	—
		30	0.15	40 to 280/300	123-1731	—
0.53	5	0.25	40 to 280/300	123-1732	123-1732E	123-1732LTM
		0.50	40 to 280/300	123-1733	123-1733E	—
		60	0.25	40 to 280/300	123-1762	—
	15	2.00	40 to 280/300	125-1704	—	—
		0.25	40 to 260/280	125-1711	—	—
		0.50	40 to 260/280	125-1717	—	—
30	1.00	40 to 260/280	125-1712	—	125-1712LTM	
		1.50	40 to 260/280	125-1713	—	—
		0.25	40 to 260/280	125-1731	—	—
	0.50	40 to 260/280	125-1737	—	—	
	1.00	40 to 260/280	125-1732	125-1732E	125-1732LTM	
	1.50	40 to 260/280	125-1733	—	—	
60	1.00	40 to 260/280	125-1762	—	—	



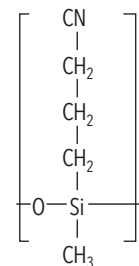
- (50%-Phenyl)-methylpolysiloxane
- Mid polarity — slightly more polar than HP-50+
- Excellent for confirmational analyses
- Bonded and cross-linked
- Solvent rinsable
- Equivalent to USP Phase G3



Agilent J&W LTM Column Modules for 7890 and 6890 Series GC Systems

Agilent DB-23

- ➔ (50%-Cyanopropyl)-methylpolysiloxane
- ➔ High polarity
- ➔ Designed for separation of fatty acid methyl esters (FAMES)
- ➔ Excellent resolution for cis- and trans-isomers
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Replaces HP-23
- ➔ Close equivalent to USP Phase G5

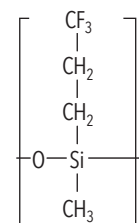


Similar Phases: SP-2330, Rtx-2330, 007-23, AT-Silar, BPX-70, SP-2340

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	INTUVO
0.18	20	0.20	40 to 250/260	121-2323	—	—
0.25	15	0.25	40 to 250/260	122-2312	—	—
	30	0.15	40 to 250/260	122-2331	—	—
		0.25	40 to 250/260	122-2332	122-2332E	122-2332-INT
	60	0.15	40 to 250/260	122-2361	122-2361E	122-2361-INT
0.32	30	0.25	40 to 250/260	123-2332	123-2332E	—
		0.25	40 to 250/260	123-2362	—	—
0.53	15	0.50	40 to 230/240	125-2312	—	—
	30	0.50	40 to 230/240	125-2332	—	—

Agilent DB-200

- ➔ (35% Trifluoropropyl)-methylpolysiloxane
- ➔ Mid polarity — more polar than DB-1701 or DB-17
- ➔ Ideal for difficult-to-separate positional isomers
- ➔ Unique interactions with compounds containing nitro, halogen and carbonyl groups
- ➔ Low ECD bleed
- ➔ Unique selectivity
- ➔ Close equivalent to USP Phase G6



Similar Phases: Rtx-200

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	7890/6890 LTM MODULE
0.25	30	0.25	30 to 300/320	122-2032	122-2032LTM
		0.50	30 to 300/320	122-2033	—
0.32	30	0.25	30 to 300/320	123-2032	—
		0.50	30 to 300/320	123-2033	—
0.53	30	1.00	30 to 280/300	125-2032	—



Agilent Premium Non-Stick Septa, page 365

Agilent DB-210

Similar Phases: SP-2401

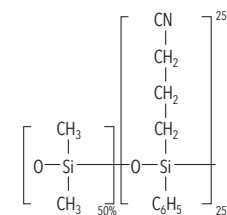
ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.25	15	0.25	45 to 240/260	122-0212	—
	30	0.25	45 to 240/260	122-0232	122-0232E
		0.50	45 to 240/260	122-0233	—
0.32	15	0.50	45 to 240/260	123-0213	—
	30	0.25	45 to 240/260	123-0232	—
		0.50	45 to 240/260	123-0233	—
0.53	15	1.00	45 to 220/240	125-0212	—
	30	1.00	45 to 220/240	125-0232	—

- ➔ (35% Trifluoropropyl)-methylpolysiloxane
- ➔ High polarity
- ➔ Excellent for U.S. EPA Methods 8140 and 609
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Exact replacement of HP-210
- ➔ Close equivalent to USP Phase G6

Agilent DB-225

Similar Phases: SP-2330, Rtx-225, BP-225, OV-225, 007-225, AT-225

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 in Cage	5 IN CAGE	7890/6890 LTM MODULE
0.10	20	0.10	40 to 220/240	127-2222	—	—
0.18	20	0.20	40 to 220/240	121-2223	—	—
0.25	15	0.25	40 to 220/240	122-2212	—	—
		0.15	40 to 220/240	122-2231	—	—
	30	0.25	40 to 220/240	122-2232	—	122-2232LTM
0.32	30	0.25	40 to 220/240	123-2232	123-2232E	—
0.53	15	1.00	40 to 200/220	125-2212	—	—
		0.50	40 to 200/220	125-2237	—	—
	30	1.00	40 to 200/220	125-2232	—	—

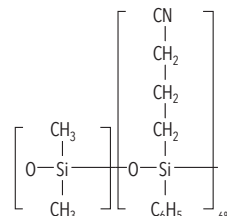


- ➔ (50% Cyanopropylphenyl)-dimethylpolysiloxane
- ➔ Mid/high polarity
- ➔ Excellent for separations of cis- and trans-fatty acid methyl esters (FAMES)
- ➔ Exact replacement of HP-225

Agilent DB-1301

Similar Phases: Rtx-1301, PE-1301

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.25	30	0.25	-20 to 280/300	122-1332	122-1332E
		1.00	-20 to 280/300	122-1333	—
	60	0.25	-20 to 280/300	122-1362	—
		1.00	-20 to 280/300	122-1363	122-1363E
0.32	30	0.25	-20 to 280/300	123-1332	—
		1.00	-20 to 280/300	123-1333	—
	60	1.00	-20 to 280/300	123-1363	—
0.53	15	1.00	-20 to 260/280	125-1312	—
		30	1.00	-20 to 260/280	125-1332
			1.50	-20 to 260/280	125-1333

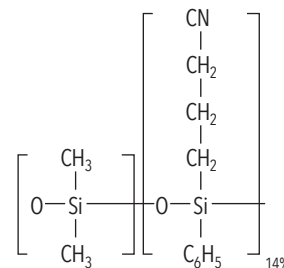


- ➔ (6% Cyanopropyl-phenyl)-methylpolysiloxane
- ➔ Equivalent to USP Phase G43
- ➔ Low/mid polarity
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Exact replacement of HP-1301 and HP-1701

Agilent DB-1701

- ➔ (14% Cyanopropyl-phenyl) methylpolysiloxane
- ➔ Low/mid polarity
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Exact replacement of HP-1301 and HP-1701

Similar Phases: SPB-1701, Rtx-1701, BP-10, OV-1701, 007-1701, ZB-1701



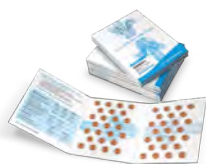
ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	INTUVO
0.10	20	0.10	-20 to 280/300	127-0722	—	—	—
		0.40	-20 to 280/300	127-0723	—	—	—
0.18	10	0.40	-20 to 280/300	—	—	—	—
	20	0.18	-20 to 280/300	121-0722	—	121-0722LTM	—
0.25	15	0.25	-20 to 280/300	122-0712	—	—	—
		1.00	-20 to 280/300	122-0713	—	—	122-0733-INT
	30	0.15	-20 to 280/300	122-0731	—	—	—
		0.25	-20 to 280/300	122-0732	122-0732E	122-0732LTM	122-0732-INT
60	1.00	-20 to 280/300	122-0733	122-0733E	122-0733LTM	—	
		0.15	-20 to 280/300	122-0761	—	—	—
	0.25	-20 to 280/300	122-0762	—	—	—	
	0.50	-20 to 280/300	122-0766	—	—	—	
0.32	15	0.25	-20 to 280/300	123-0712	—	123-0712LTM	—
		1.00	-20 to 280/300	123-0713	—	—	—
	30	0.15	-20 to 280/300	123-0731	—	—	—
		0.25	-20 to 280/300	123-0732	123-0732E	—	123-0732-INT
50	1.00	-20 to 280/300	123-0733	123-0733E	—	123-0733-INT	
		0.25	-20 to 280/300	123-0762	—	—	—
60	1.00	-20 to 280/300	123-0763	123-0763E	—	—	
		0.25	-20 to 280/300	123-0762	—	—	—
0.53	15	1.00	-20 to 260/280	125-0712	125-0712E	—	—
	30	0.25	-20 to 260/280	125-0731	—	—	—
		0.50	-20 to 260/280	125-0737	—	—	—
		1.00	-20 to 260/280	125-0732	125-0732E	—	—
	1.50	-20 to 260/280	125-0733	—	—	—	
60	1.00	-20 to 260/280	125-0762	125-0762E	—	—	



CHROM TECH RELATED PRODUCTS



Agilent Gas Clean Filters, page 395



Agilent Premium Non-Stick Septa, page 365



Agilent ADM Flowmeter, page 392



Agilent Certified Vials, page 18

Agilent CP-Sil 19 CB

- ➔ 14% cyanopropyl-phenyl/86% dimethylpolysiloxane
- ➔ Mid polarity
- ➔ Ideal for many environmental, food and beverage, and pharmaceutical applications
- ➔ Useful as confirmation column
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Broad range of configurations available
- ➔ Supplied with an EZ-GRIP to simplify column installation, coupling and operation

Similar Phases: SPB-1701, Rtx-1701, BP-10, OV-1701, 007-1701, ZB-1701

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.15	25	0.50	-25 to 275/300	CP7340	—
0.25	10	0.20	-25 to 275/300	CP7702	—
		0.20	-25 to 275/300	CP7712	—
	25	0.40	-25 to 275/300	CP7809	—
		1.20	-25 to 275/300	CP7672	—
		30	0.25	-25 to 275/300	CP8712
	30	1.00	-25 to 275/300	CP8562	—
		50	0.20	-25 to 275/300	CP7722
	50		0.40	-25 to 275/300	—
		60	0.25	-25 to 275/300	CP8722
	0.32	10	0.20	-25 to 275/300	CP7732
0.25			-25 to 275/300	CP8542	—
25		0.20	-25 to 275/300	CP7742	—
		0.40	-25 to 275/300	CP7829	—
		1.20	-25 to 275/300	CP7762	—
30		0.25	-25 to 275/300	CP8842	—
		1.00	-25 to 275/300	CP8762	—
50		0.20	-25 to 275/300	CP7752	—
		0.40	-25 to 275/300	CP7839	—
		1.20	-25 to 275/300	CP7772	—
60		1.00	-25 to 275/300	CP8772	—
0.53		10	2.00	-25 to 275/300	CP7647
	1.00		-25 to 275/300	CP7637	—
	25	2.00	-25 to 275/300	CP7657	—
		1.00	-25 to 275/300	CP8737	—
	50	2.00	-25 to 275/300	CP7667	—
		1.00	-25 to 275/300	CP7697	—



UltiMetal Plus Ultimate Union, page 371
Leak-free connection of guard columns or retention gaps

Agilent J&W Polyethylene Glycol (PEG) Columns


Agilent offers a full range of PEG column. Even though each phase is based on the polyethylene glycol polymer, strict control of the cross-linking and deactivation processes result in variety of unique phase characteristics to meet your varying analysis needs.

Agilent DB-WAX and DB-WaxFF

Similar Phases: SUPELCOWAX 10, SUPEROX II, CB-WAX, Stabilwax, BP-20, 007-CW, Carbowax, Rtx-WAX, ZB-WAX, ZB-WAX plus

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	5975T LTM TOROID
DB-WAX							
0.05	10	0.05	20 to 250/260	126-7012	—	—	—
		0.10	20 to 240/250	126-7013	—	—	222-7013LTM
0.10	10	0.10	20 to 250/260	127-7012	127-7012E	—	—
		0.20	20 to 240/250	127-7013	—	—	—
	20	0.10	20 to 250/260	127-7022	—	127-7022LTM	—
		0.20	20 to 240/250	127-7023	127-7023E	—	—
0.18	10	0.18	20 to 250/260	121-7012	—	121-7012LTM	—
		0.30	20 to 240/250	121-7023	—	121-7023LTM	—
	20	0.18	20 to 250/260	121-7022	121-7022E	121-7022LTM	—
		0.30	20 to 240/250	121-7023	—	121-7023LTM	—
		0.30	20 to 240/250	121-7043	—	—	—
0.20	25	0.20	20 to 250/260	128-7022	—	—	—
	30	0.20	20 to 250/260	128-7032	—	—	—
	50	0.20	20 to 250/260	128-7052	—	—	—
0.25	15	0.25	20 to 250/260	122-7012	122-7012E	122-7012LTM	—
		0.50	20 to 240/250	122-7013	—	—	—
	30	0.15	20 to 250/260	122-7031	—	—	—
		0.25	20 to 250/260	122-7032	122-7032E	122-7032LTM	—
		0.50	20 to 240/250	122-7033	122-7033E	122-7033LTM	222-7033LTM
	60	0.15	20 to 250/260	122-7061	—	—	—
0.25		20 to 250/260	122-7062	122-7062E	—	—	
0.50		20 to 240/250	122-7063	122-7063E	—	—	
0.32	15	0.25	20 to 250/260	123-7012	—	123-7012LTM	—
		0.50	20 to 240/250	123-7013	—	123-7013LTM	—
	30	0.15	20 to 250/260	123-7031	—	—	—
		0.25	20 to 250/260	123-7032	123-7032E	123-7032LTM	—
		0.50	20 to 240/250	123-7033	123-7033E	123-7033LTM	—
	60	0.25	20 to 250/260	123-7062	—	—	—
		0.50	20 to 240/250	123-7063	123-7063E	—	—
	0.45	30	0.85	20 to 230/240	124-7032	—	—
0.53	15	0.50	20 to 230/240	125-7017	—	—	—
		1.00	20 to 230/240	125-7012	125-7012E	—	—
	30	0.25	20 to 230/240	125-7031	—	125-7032LTM	—
		0.50	20 to 230/240	125-7037	—	—	—
		1.00	20 to 230/240	125-7032	125-7032E	125-7032LTM	—
	60	1.00	20 to 230/240	125-7062	125-7062E	—	—
DB-WAXFF							
0.10	20	0.20	20 to 240/250	127-7023FF	—	—	—

- ➔ Polyethylene glycol (PEG)
- ➔ Equivalent to USP Phase G16
- ➔ High polarity
- ➔ Lower temperature limit of 20 °C is the lowest of any bonded PEG phase; improves resolution of low boiling point analytes
- ➔ Column-to-column reproducibility
- ➔ Bonded and cross-linked
- ➔ Exact replacement of HP-WAX
- ➔ Solvent rinsable
- ➔ DB-WaxFF is a highly reproducible, specially tested microbore DB-Wax for fragrance analysis



CHROM TECH RELATED PRODUCTS

PART NO	TEST MIX FOR DB-WAX
200-0070	0.05 & 0.10 mm ID
200-0370	0.18 & 0.32 mm ID
200-0070	0.45 & 0.53 mm ID

Compare your column's performance to the test chromatogram shipped with your Agilent J&W column. The column test standard contains components that test the column for resolution characteristics, efficiency, and inertness. The test mixes are supplied at a concentration of 250 ng/µL in 2 mL vials.



Agilent DB-WAXetr

Similar Phases: SUPELCOWAX 10, SUPEROX II, CB-WAX, Stabilwax, BP-20, 007-CW, Carbowax, Rtx-WAX, ZB-WAX,ZB-WAX plus

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7890/6890			
				7 IN CAGE	5 IN CAGE	LTM MODULE	INTUVO
0.20	25	0.40	30 to 250/260	128-7323	—	—	—
0.25	30	0.25	30 to 260/280	122-7332	122-7332E	122-7332LTM	122-7332-INT
		0.50	30 to 250/260	122-7333	—	—	—
	60	0.25	30 to 260/290	122-7362	—	—	—
		0.50	30 to 250/260	122-7363	—	—	—
0.32	15	0.25	30 to 260/280	123-7312	—	—	—
		1.00	30 to 250/260	123-7314	—	—	—
	30	0.25	30 to 260/280	123-7332	—	—	—
		0.50	30 to 250/260	123-7333	—	—	—
		1.00	30 to 250/260	123-7334	—	123-7334LTM	—
	50	1.00	30 to 250/260	123-7354	123-7354E	—	—
	60	0.25	30 to 260/280	123-7362	—	—	—
		0.50	30 to 250/260	123-7363	—	—	—
		1.00	30 to 250/260	123-7364	—	—	—
	0.53	15	1.00	30 to 240/260	125-7312	—	—
2.00			30 to 230/250	125-7314	—	—	—
30		1.00	30 to 240/260	125-7332	125-7332E	—	—
		1.50	30 to 230/240	125-7333	—	—	—
		2.00	30 to 230/250	125-7334	125-7334E	—	—
60		1.00	30 to 240/260	125-7362	—	—	—

- ➔ Polyethylene glycol (PEG)
- ➔ Extended Temperature Range (etr)
- ➔ High polarity
- ➔ Excellent column-to-column repeatability
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Equivalent to USP Phase G16



CHROM TECH RELATED PRODUCTS

PART NO	TEST MIX FOR DB-WAXETR
200-0070	0.45 & 0.53 mm ID
200-0370	0.18 & 0.32 mm ID

Compare your column's performance to the test chromatogram shipped with your Agilent J&W column. The column test standard contains components that test the column for resolution characteristics, efficiency, and inertness. The test mixes are supplied at a concentration of 250 ng/µL in 2 mL vials.



Agilent HP-INNOWax

- ➔ Polyethylene glycol (PEG)
- ➔ High polarity
- ➔ Higher upper temperature limits of bonded PEG phases
- ➔ Column-to-column repeatability
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Close equivalent to USP Phase G16

Similar Phases: SUPELLOWAX 10, SUPEROX II, CB-WAX, Stabilwax, BP-20, 007-CW, Carbowax, ZB-WAX, ZB-WAX+

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	5975T LTM TOROID	INTUVO
0.18	20	0.18	40 to 260/270	19091N-577i	19091N-577Ei	19091N-577LTMi	—	—
0.20	25	0.20	40 to 260/270	19091N-102i	—	—	—	—
		0.40	40 to 260/270	19091N-202i	—	—	—	—
	50	0.20	40 to 260/270	19091N-105i	19091N-105Ei	—	—	—
		0.40	40 to 260/270	19091N-205i	19091N-205Ei	—	—	—
0.25	5	0.15	40 to 260/270	19091N-030i	—	19091N-030LTMi	—	—
	15	0.10	40 to 260/270	19091N-331i	—	—	—	—
		0.25	40 to 260/270	19091N-131i	19091N-131Ei	—	—	—
		0.50	40 to 260/270	19091N-231i	—	—	—	—
	30	0.15	40 to 260/270	19091N-033i	—	—	—	—
		0.25	40 to 260/270	19091N-133i	19091N-133Ei	19091N-133LTMi	29091N-133LTMi	19091N-133-INTi
		0.50	40 to 260/270	19091N-233i	19091N-233Ei	—	—	—
	60	0.15	40 to 260/270	19091N-036i	—	—	—	—
0.25		40 to 260/270	19091N-136i	19091N-136Ei	—	—	—	
0.50		40 to 260/270	19091N-236i	—	—	—	—	
0.32	15	0.25	40 to 260/270	19091N-111i	—	—	—	—
	30	0.15	40 to 260/270	19091N-013i	—	19091N-013LTMi	—	—
		0.25	40 to 260/270	19091N-113i	19091N-113Ei	—	—	19091M-113-INTi
		0.50	40 to 260/270	19091N-213i	19091N-213Ei	—	—	19091N-213-INTi
	60	0.25	40 to 260/270	19091N-116i	—	—	—	—
0.50		40 to 260/270	19091N-216i	19091N-216Ei	—	—	19091N-216-INTi	
0.53	15	1.00	40 to 240/250	19095N-121i	—	—	—	—
	30	1.00	40 to 240/250	19095N-123i	19095N-123Ei	—	—	—
	60	1.00	40 to 240/250	19095N-126i	—	—	—	—



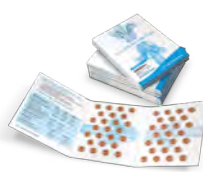
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Agilent CP-Wax 52 CB

Similar Phase: SUPELCOWAX 10, SUPEROX II, CB-WAS, Stabilwax, BP-20, 007-CW, Carbowax, HP-INNOWAX, RTX-WAX, ZB-WAX, ZB-WAX+

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.10	10	0.10	20 to 250/265	CP7334i	—
		0.20	20 to 250/265	CP7335i	—
	20	0.20	20 to 250/265	CP7345i	—
0.15	15	0.15	20 to 250/265	CP7791i	—
	25	0.25	20 to 250/265	CP7792i	—
0.20	30	0.20	20 to 250/265	CP7775i	—
	50	0.20	20 to 250/265	CP7785i	—
0.25	10	0.20	20 to 250/265	CP7703i	—
	15	0.25	20 to 250/265	CP8513i	—
	25	0.20	20 to 250/265	CP7713i	CP7713i5i
		1.20	20 to 250/265	CP7673i	CP7673i5i
	30	0.15	20 to 250/265	CP8745i	—
		0.25	20 to 250/265	CP8713i	CP8713i5i
		0.50	20 to 250/265	CP8746i	—
	50	0.20	20 to 250/265	CP7723i	CP7723i5i
	60	0.25	20 to 250/265	CP8723i	—
		0.50	20 to 250/265	CP8748i	—
0.32	10	1.00	20 to 250/265	CP7628i	—
	15	0.25	20 to 250/265	CP8543i	—
		0.50	20 to 250/265	CP8553i	—
		0.20	20 to 250/265	CP7743i	—
	25	0.40	20 to 250/265	CP7879i	—
		1.20	20 to 250/265	CP7763i	—
		0.15	20 to 250/265	CP8757i	—
	30	0.25	20 to 250/265	CP8843i	—
		0.50	20 to 250/265	CP8763i	—
		0.20	20 to 250/265	CP7753i	—
	50	0.40	20 to 250/265	CP7889i	—
		1.20	20 to 250/265	CP7773i	CP7773i5i
0.25		20 to 250/265	CP8853i	—	
60	0.50	20 to 250/265	CP8773i	—	
	1.20	20 to 250/265	CP8073i	CP8073i5i	
	0.20	20 to 250/265	CP7648i	—	
0.53	10	2.00	20 to 250/265	CP7648i	—
	15	1.00	20 to 250/265	CP8718i	—
		2.00	20 to 250/265	CP7638i	—
	25	1.00	20 to 250/265	CP7638i	—
		2.00	20 to 250/265	CP7658i	CP7658i5i
	30	1.00	20 to 250/265	CP8738i	—
	50	1.00	20 to 250/265	CP7698i	—
		2.00	20 to 250/265	CP7668i	—
		1.00	20 to 250/265	CP8798i	—
	60	1.00	20 to 250/265	CP8798i	—
100	2.00	20 to 250/265	CP7678i	—	

- ➔ Polyethylene glycol phase
- ➔ High polarity
- ➔ Wider temperature range than non-bonded polyethylene glycols
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ High resolution of low boiling point analytes
- ➔ High polarity provides separations for a broad range of applications
- ➔ Excellent reproducibility and temperature stability for a variety of EPA and ASTM methods
- ➔ Supplied with an EZ-GRIP to simplify column installation, coupling and operation

TECH TIP

We recommend the UltiMetal column when working in rugged environments with process or portable instruments.

CP-Wax 52 CB UltiMetal

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	PART NO
53	10	1.00	20 to 250/275	CP7148
		2.00	20 to 250/275	CP7178
	50	1.00	20 to 250/275	CP7168
		2.00	20 to 250/275	CP7179

Agilent Carbowax 20M and HP-20M

- Polyethylene glycol, MW 20,000
- Equivalent to USP Phase G16

Similar Phases: Rt-CW20M F&F

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
CARBOWAX 20M						
0.25	30	0.25	60 to 220/240	112-2032	—	112-2032LTM
0.32	30	0.25	60 to 220/240	113-2032	—	—
HP-20M						
0.20	25	0.10	60 to 220	19091W-102	—	—
	50	0.10	60 to 220	19091W-105	—	—
0.32	25	0.30	60 to 220	19091W-012	19091W-012E	19091W-012LTM
	50	0.30	60 to 220	19091W-015	19091W-015E	—
0.53	10	1.33	60 to 220	19095W-121	—	—
	30	1.33	60 to 220	19095W-123	—	—

TECH TIP

Because the Carbowax 20M and the HP-20M are not bonded or cross-linked, we do not recommend solvent rinsing. DB-WAX is the recommended bonded alternate for the HP-20M.

Agilent HP- FFAP

- Nitroterephthalic acid modified polyethylene glycol
- High polarity
- Temperature range from 60 °C to 240/250 °C (230/240 °C for 0.53 mm)
- Designed for the analysis of volatile fatty acids and phenols
- Replaces OV-351
- Bonded and cross-linked
- Solvent rinsable
- Close equivalent to USP Phase G35

Similar Phases: Stabilwax-DA, Nukol, 007-FFAP, BP21, AT-1000, OV-351

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.20	25	0.30	60 to 240/250	19091F-102	19091F-102E	19091F-102LTM
	50	0.30	60 to 240/250	19091F-105	19091F-105E	—
0.25	30	0.25	60 to 240/250	19091F-433	19091F-433E	19091F-433LTM
0.32	25	0.50	60 to 240/250	19091F-112	19091F-112E	19091F-112LTM
	30	0.25	60 to 240/250	19091F-413	—	—
	50	0.50	60 to 240/250	19091F-115	19091F-115E	—
0.53	10	1.00	60 to 240	19095F-121	—	19095F-121LTM
	15	1.00	60 to 240	19095F-120	19095F-120E	—
	30	1.00	60 to 240	19095F-123	19095F-123E	19095F-123LTM

TECH TIP

We do not recommend the use of water or methanol to rinse HP-FFAP GC columns.



CHROM TECH RELATED PRODUCTS

PART NO	DESCRIPTION
8500-6813	Test mix for HP-FFAP

Compare your column's performance to the test chromatogram shipped with your Agilent J&W column. The column test standard contains components that test the column for resolution characteristics, efficiency, and inertness. The test mixes are supplied at a concentration of 250 ng/µL in 2 mL vials.



Agilent DB-FFAP

- ➔ Nitroterephthalic acid modified polyethylene glycol
- ➔ High polarity
- ➔ Temperature range from 40 °C to 250 °C
- ➔ Designed for the analysis of volatile fatty acids and phenols
- ➔ Replaces OV-351
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable
- ➔ Close equivalent to USP Phase G35

TECH TIP

We do not recommend the use of water or methanol to rinse DB-FFAP GC columns.

Similar Phases: Stabilwax-DA, Nukol, 007-FFAP, BP21, AT-1000, OV-351

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	5975T LTM TOROID	INTUVO
0.10	10	0.10	40 to 250	127-3212	—	—	—	—
	15	0.10	40 to 250	127-32H2	—	—	—	—
0.25	15	0.25	40 to 250	122-3212	—	—	222-3212LTM	—
	30	0.25	40 to 250	122-3232	122-3232E	122-3232LTM	222-3232LTM	122-3232-INT
		0.50	40 to 250	122-3233	—	—	—	—
	60	0.25	40 to 250	122-3262	122-3262E	—	—	—
		0.50	40 to 250	122-3263	—	—	—	—
0.32	15	0.25	40 to 250	123-3212	—	—	—	—
	25	0.50	40 to 250	123-3223	—	—	—	—
	30	0.25	40 to 250	123-3232	123-3232E	123-3232LTM	—	—
		0.50	40 to 250	123-3233	—	123-3233LTM	—	—
	60	1.00	40 to 250	123-3234	—	123-3234LTM	—	123-3234-INT
		0.50	40 to 250	123-3253	—	—	—	—
	60	0.25	40 to 250	123-3262	—	—	—	—
		0.50	40 to 250	123-3263	—	—	—	—
	1.00	40 to 250	123-3264	—	—	—	—	
0.45	30	0.85	40 to 250	124-3232	—	—	—	
0.53	10	1.00	40 to 250	125-32H2	—	—	—	—
	15	0.50	40 to 250	125-3217	—	—	—	—
		1.00	40 to 250	125-3212	—	—	—	—
	30	0.25	40 to 250	125-3231	—	—	—	—
		0.50	40 to 250	125-3237	—	—	—	—
	60	1.00	40 to 250	125-3232	125-3232E	—	—	—
		1.50	40 to 250	125-3233	—	—	—	—
	60	1.00	40 to 250	125-3262	—	—	—	—



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Agilent Specialty Columns

Agilent chemists have developed many columns with unique characteristics designed to solve the most difficult separation problems of a given method. As a result, we offer a comprehensive line of specialty or "select" columns for a variety of applications to enhance the standard phase portfolio. With columns for volatiles, pesticides, petrochemicals and more — Agilent exceeds standard QA/QC procedures for the manufacturing and testing of all of our specialty columns to ensure they meet the stringent demands for their application. These columns offer reliable, accurate results with the shortest run times possible on complex sample lists and matrices.

Agilent DB-1ht | High Temperature Column

- ➔ 100% Dimethylpolysiloxane
- ➔ Non-polar
- ➔ Specially processed for extended temperature limit of 400 °C
- ➔ High temperature, polyimide-coated, fused silica tubing
- ➔ Excellent peak shape and faster elution times for high boilers
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable

Similar Phases: Rxi-1HT, Stx-1ht, ZB-1ht

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	5975T LTM TOROID
0.25	15	0.10	-60 to 400	122-1111	122-1111E	—	222-1111LTM
	30	0.10	-60 to 400	122-1131	—	—	222-1131LTM
0.32	15	0.10	-60 to 400	123-1111	—	123-1111LTM	—
	30	0.10	-60 to 400	123-1131	123-1131E	—	—
0.53	30	0.17	-60 to 400	125-1131	—	—	—



CHROM TECH RELATED PRODUCTS

PART NO	TEST MIX FOR DB-1HT
200-0010	0.18 & 0.32 mm ID



Compare your column's performance to the test chromatogram shipped with your Agilent J&W column. The column test standard contains components that test the column for resolution characteristics, efficiency, and inertness. The test mixes are supplied at a concentration of 250 ng/μL in 2 mL vials.

Agilent DB-5ht | High Temperature Column

- ➔ (5%-Phenyl)-methypolysiloxane
- ➔ Non-polar
- ➔ Specially processed for extended temperature limit of 400 °C
- ➔ High temperature, polyimide-coated, fused silica tubing
- ➔ Excellent peak shape and faster elution times for high boilers
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable

Similar Phases: HT5, Stx-5ht, ZB-5ht

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	5975T LTM TOROID	INTUVO
0.25	15	0.10	-60 to 400	122-5711	122-5711E	—	222-5711LTM	—
	30	0.10	-60 to 400	122-5731	—	122-5731LTM	222-5731LTM	—
0.32	5	0.10	-60 to 400	—	—	—	—	123-57J1-INT
	10	0.10	-60 to 400	123-5701	—	123-5701LTM	—	—
	15	0.10	-60 to 400	123-5711	123-5711E	—	—	—
	30	0.10	-60 to 400	123-5731	123-5731E	—	—	—



CHROM TECH RELATED PRODUCTS

PART NO	TEST MIX FOR DB-5HT
200-0010	0.18 & 0.32 mm ID



Compare your column's performance to the test chromatogram shipped with your Agilent J&W column. The column test standard contains components that test the column for resolution characteristics, efficiency, and inertness. The test mixes are supplied at a concentration of 250 ng/μL in 2 mL vials.

Agilent DB-17ht | High Temperature Column

Similar Phases: Rtx-65TG, BPX50

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.20	5	0.15	40 to 340/365	122-1801	—	—
	15	0.15	40 to 340/365	122-1811	—	—
	30	0.15	40 to 340/365	122-1831	—	122-1831LTM
0.32	15	0.15	40 to 340/365	123-1811	—	—
	30	0.15	40 to 340/365	123-1831	123-1831E	—
	60	0.15	40 to 340/365	123-1861	—	—

- ➔ (50%-Phenyl)-Methylpolysiloxane
- ➔ Mid-polarity
- ➔ Extended upper temperature limit of 365 °C
- ➔ High temperature, polyimide-coated, fused silica tubing
- ➔ Excellent peak shape and faster elution times for high boilers
- ➔ Improved resolution for triglycerides
- ➔ Ideal for confirmational analyses
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable

Agilent Petroleum Columns

Petroleum applications vary greatly in character. From noble gases to simulated distillation, Agilent offers a broad range of columns designed to meet the needs of the petroleum/petrochemical chromatographer. Refer to the PLOT column section for columns for the analysis of light gases.

Agilent CP-Sil PONA CB | Petroleum Column

Similar Phases: Petrocol DH, SPB-1, 007-1, Rtx-1, MXT-1

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.21	50	0.50	250/275	CP7531	CP7531I5
0.25	100	0.50	250/275	CP7530	—
0.25	150	1.00	250/275	CP7945	—

- ➔ High resolution analysis of paraffins, olefins, naphthalenes and aromatics in complex hydrocarbon mixtures
- ➔ Engineered for hydrocarbon analysis according to ASTM (DHA method)

Agilent HP-PONA | Petroleum Column

Similar Phases: Petrocol DH, SPB-1, 007-1, Rtx-1, MXT-1, Rtx-1PONA, Rtx-DHA

DESCRIPTION	ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
HP-PONA	0.20	50	0.50	-60 to 325/350	19091S-001	19091S-001E
HP-1	0.20	50	0.50	-60 to 325/350	19091Z-205	19091Z-205E
HP-1	0.25	100	0.50	-60 to 325/350	19091Z-530	19091Z-530E

100 PSI regulator required to reach optimum carrier gas velocity.

- ➔ 100% Dimethylpolysiloxane
- ➔ Configured for the analysis of petroleum process products
- ➔ Tested to ensure the resolution of m-xylene from p-xylene and of cyclopentane from 2,3-dimethylbutane

Agilent DB-Petro | Petroleum Column

Similar Phases: Petrocol DH, SPB-1, 007-1, Rtx-1, MXT-1

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.20	50	0.50	-60 to 325/350	128-1056	—
0.25	100	0.50	-60 to 325/350	122-10A6	122-10A6E

100 PSI regulator required to reach optimum carrier gas velocity.

- ➔ 100% Dimethylpolysiloxane
- ➔ Configured for the analysis of petroleum process products
- ➔ Bonded and cross-linked—Solvent rinsable

Agilent DB-2887 | Petroleum Column

Similar Phases: Petrocol EX2887, MXT-2887, MXT-1, Rtx-2887

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.53	10	3.00	-60 to 350	125-2814	125-2814E	125-2814LTM

- Specifically designed for simulated distillation using ASTM Method D 2887

Agilent DB-HT SimDis | Petroleum Column

Similar Phases: Petrocol EX2887, MXT-2887, Rtx-2887, AC Controls High Temp Sim Dist, AT-2887, ZB-1XT SimDist

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE
0.53	5	0.10	-60 to 400/430	145-1009
		0.15	-60 to 400/430	145-1001

- "Boiling point" phase for high temperature simulated distillation
- Distillation range of C6 to C110+

Agilent CP-SimDist | Petroleum Column

Similar Phases: Petrocol EX2887, MXT-2887, Rtx-2887, AC Controls High Temp Sim Dist, AT-2887, ZB-1XT SimDist

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.32	10	0.10	375/400	CP7521	—
0.53	5	0.17	375/400	CP7522	CP7522I5
	10	0.10	375/400	CP7541	—

- For simulated distillation analysis up to C100
- High temperature non-polar stationary phase
- Low bleed improves quantitation

Agilent CP-TCEP for Alcohols in Gasoline | Petroleum Column

Similar Phases: Rt-TCEP

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.25	50	0.40	135/140	CP7525	CP7525I5

For optimum performance, ferrules should be replaced every time column is replaced and during column maintenance.

- Engineered for analysis of alcohols in gasoline
- Unique selectivity separates benzene after n-dodecane

Agilent Select Low Sulfur | Petroleum Column

ID (mm)	LENGTH (m)	TEMP LIMITS (°C)	7 IN CAGE
0.32	60	185	CP8575

- Unique selectivity prevents co-elution and matrix interferences in propylene streams

Agilent Select for Permanent Gases—Dual Column | Petroleum Column

DESCRIPTION	TEMP LIMITS (°C)	7 IN CAGE
Select Permanent Gases/CO2	300/325	CP7429
Select Permanent Gases/HR	300/325	CP7430

- Set of two parallel columns: CP-Molsieve 5Å for permanent gases and PoraBOND Q for CO2 analysis
- Isothermal separation at temperatures > 40 °C eliminates the need for cryogenics

Agilent Select Al₂O₃MAPD | Petroleum Column

Similar Phases: Rt-Alumina BOND/MAPD, MXT-Alumina BOND/MAPD

ID (mm)	LENGTH (m)	TEMP LIMITS (°C)	7 IN CAGE
0.32	50	-100 to 200/200	CP7431
0.53	25	-100 to 200/200	CP7433
	50	-100 to 200/200	CP7432

- Aluminum oxide PLOT column for the analysis of reactive hydrocarbons such as methyl acetylene and propadiene (MAPD)
- Two-fold high response for MAPD, especially important when running impurity analyses

Agilent J&W Biodiesel Capillary GC Columns

Agilent Select Biodiesel

TECHNICAL SPECIFICATIONS				
METHODS	ANALYTES	COLUMN	INJ. TYPE	ANALYSIS TIME
ASTM D 6584	Free and total glycerine	Select Biodiesel for Glycerides	On-column	32 min
EN14103	Ester and linoleic acid methyl esters	Select Biodiesel for FAME	Split/splitless	30 min
EN14105	Free and total glycerine; mono, di- and tri-glycerides	Select Biodiesel for Glycerides	On-column	35 min
EN14016	Free glycerol	Select Biodiesel for Glycerides	Split/splitless	10 min
EN14110	Methanol	Select Biodiesel for Methanol	Headspace with split/splitless	10 min

- Complete set of biodiesel columns for full compliance and ease-of-use
- UltiMetal technology provides high accuracy and longevity
- Pre-tested for complete confidence in results
- Good column lifetime when operating at temperatures up to 400 °C
- UltiMetal column with ultra stable stationary phase
- Convenient pre-coupled retention gap that is leak tested

DESCRIPTION	ID (mm)	LENGTH (m)	FILM (µm)	7 IN CAGE
For glycerides, UltiMetal, with retention gap	0.32	15	0.10	CP9078
For glycerides, UltiMetal	0.32	15	0.10	CP9079
For glycerides, UltiMetal, with retention gap	0.32	10	0.10	CP9076
For glycerides, UltiMetal	0.32	10	0.10	CP9077
For FAME, fused silica	0.32	30	0.25	CP9080
For Methanol, fused silica	0.32	30	3.00	CP9083
UltiMetal retention gap, methyl deactivated	0.53	2	—	CP6530

Agilent CP-Volamine

Similar Phases: Rtx-Volatile Amines

ID (mm)	LENGTH (m)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.32	15	265/300	CP7446	—
	30	265/300	CP7447	CP744715
	60	265/275	CP7448	CP744815

- Non polar stationary phase
- Excellent stability for samples containing water expands the application range
- Highly inert providing sharp amine peaks for accurate results
- Produces symmetrical peaks due to MPD (Multi-Purpose Deactivation) technology
- Ideal for analyzing volatile amines like MMA, DMA and TMA

Agilent CP-Sil 8 CB for Amines

Similar Phases: Rtx-5 Amine

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.15	25	2.00	325/350	CP7599	—
0.25	30	0.25	325/350	CP7598	CP7598I5
		0.50	325/350	CP7595	CP7595I5
0.32	30	1.00	325/350	CP7596	CP7596I5
0.53	30	1.00	325/350	CP7597	—

- Base deactivated 5% phenyl polydimethylpolysiloxane
- Optimized inertness performance for a broad range of Amine compounds
- Thermal stability up to 350 °C enable separations of Amines up to C20 as well as alkanolanmines
- Base deactivated columns also available as CP-Wax for Amines

Agilent Pesticides Columns

Agilent J&W low-bleed columns are ideal for the analysis of pesticides. Not only do they possess less bleed than a standard polymer, which improves the signal-to-noise ratio and minimum detectable quantities, but they also have higher upper temperature limits which allow for faster run times. Agilent also offers common phases with additional pesticide-specific testing to ensure performance for your application.

Agilent VF-5 Pesticides | Pesticides Column

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE
0.25	30	0.25	-60 to 325/350	CP9074
	50	0.25	-60 to 325/350	CP9073
0.32	30	0.25	-60 to 325/350	CP9075

- Tested with key pesticides including endrin and aldrin for optimal performance and consistency of results
- Highly inert for enhanced ECD and MS detection

Agilent VF-1701 | Pesticides Column

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE
0.25	30	0.25	-20 to 280/300	CP9070
	50	0.25	-20 to 280/300	CP9072
0.32	30	0.25	-20 to 280/300	CP9071

- Highly inert columns individually tested with key pesticides, including endrin and aldrin
- Proven performance with ECD or MS detection
- Ultra low bleed to improve sensitivity

Agilent DB-1701P | Pesticides Column

Similar Phases: SPB-1701, Rtx-1701, BP-10, CB-1701, OV-1701, 007-1701, ZB-1701P

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	7890/6890	
					LTM MODULE	INTUVO
0.25	30	0.25	-20 to 280/300	122-7732	122-7732LTM	122-7732-INT
0.32	25	0.25	-20 to 280/300	123-7722	—	—
	30	0.25	-20 to 280/300	123-7732	—	123-7732-INT
0.53	30	1.00	-20 to 260/280	125-7732	—	—

- Low/mid-polarity
- Exact replacement of HP-PAS1701
- Specifically designed and processed for the analysis of organochlorine pesticides
- ECD tested to ensure minimal pesticide breakdown and low ECD bleed
- Bonded and cross-linked
- Solvent rinsable

Agilent DB-608 | Pesticides Column

Similar Phases: SPB-608, NON-PAKD Pesticide, 007-608

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5975T LTM TOROID
0.18	20	0.18	40 to 280/300	—	221-6822LTM
0.25	30	0.25	40 to 280/300	122-6832	—
0.32	30	0.50	40 to 280/300	123-1730	—
0.53	30	0.50	40 to 260/280	125-6837	—
		0.83	40 to 260/280	125-1730	—

- Specifically designed for the analysis of chlorinated pesticides and PCBs
- U.S. EPA Methods: 608, 508, 8080
- Excellent inertness and recoveries without pesticide breakdown
- Bonded and cross-linked
- Solvent rinsable
- Exact replacement of HP-608

Agilent PAH Columns

Agilent Select PAH

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE
0.15	15	0.10	40 to 325/350	CP7461
0.25	30	0.15	40 to 325/350	CP7462

- Full separation for all PAH isomers avoids false positives and inaccurate results
- Full separation of EPA PAHs in less than 7 min and EU PAHs in less than 30 min including separation of chrysene, triphenylene and benzo[fluoranthene] (type b, j, and k)

Agilent DB-EUPAH

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	INTUVO
0.18	20	0.14	40 to 320/340	121-9627	121-9627-INT
0.25	60	0.25	40 to 320/340	122-96L2	—

- Specially designed for analysis of EU regulated PAHs
- Individually tested with application-specific QC test probe mixture
- Great resolution of critical isomers, e.g. benzo(b,j,k) fluoranthenes
- Superb thermal stability for accurate analysis of high boiling PAHs, e.g. dibenzopyrenes
- Excellent signal-to-noise ration
- Optimized column dimensions for proven performance



CHROM TECH RELATED PRODUCTS



Agilent Gas Clean Filters, page 395



Agilent Certified Vials, page 18



Agilent Premium Non-Stick Septa, page 365

Agilent Semivolatiles Columns

Semivolatiles are usually extracted from soil samples or other environmental matrices. GC columns with precise retention time reproducibility and good mass spectrometer performance are key enablers for these often demanding analyses.

Agilent DB-UI 8270D | Semivolatile Column

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS ($^{\circ}\text{C}$)	7 IN CAGE
0.18	20	0.36	-60 to 325/350	121-9723
0.25	30	0.25	-60 to 325/350	122-9732
		0.50	-60 to 325/350	122-9736

- Designed for EPA Method 8270D and other regulated GC/MS semivolatiles analysis
- Special semivolatiles testing ensures proof of column to column performance for trace level analysis
- Excellent 2,4-dinitrophenol response
- Ultra Inertness and Low bleed

Agilent DB-5.625 | Semivolatile Column

Similar Phases: XTI-5, Rtx-5, PTE-5, BPX-5

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS ($^{\circ}\text{C}$)	7 IN CAGE
0.18	20	0.18	-60 to 325/350	121-5621
		0.36	-60 to 325/350	121-5622
0.25	30	0.25	-60 to 325/350	122-5631
		0.50	-60 to 325/350	122-5632
		1.00	-60 to 325/350	122-5633
0.32	30	0.25	-60 to 325/350	123-5631
		0.50	-60 to 325/350	123-5632

- Close equivalent to a (5%-Phenyl)-methylpolysiloxane
- Non-polar
- Specially processed to exhibit excellent inertness for EPA Semivolatiles Methods 625, 1625, 8270 and CLP protocols*
- Surpasses EPA performance criteria for semivolatiles
- Inert for base, neutral & acidic compounds
- High temperature limit with excellent thermal stability and low bleed
- Bonded and cross-linked—Solvent rinsable

*Pentachlorophenol, 2,4-dinitrophenol, carbazole, and N-nitrosodiphenylamine used to test response factors.

Agilent DB-Dioxin | Semivolatile Column

Similar Phases: SP-2331, 007-23, Rtx-2332, Rtx-Dioxin

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS ($^{\circ}\text{C}$)	7 IN CAGE
0.25	60	0.15	40 to 250/270	122-2461
		0.25	40 to 250/270	122-2462

- Specifically engineered for the analysis of polychlorinated dibenzodioxins (PCDDs) and dibenzofurans (PCDFs)
- Resolves 2,3,7,8-TCDD and 2,3,7,8-TCDF from all other isomers in one run
- Low bleed
- Bonded and cross-linked
- Solvent rinsable

TECH TIP

100 PSI regulator required to reach optimum carrier gas velocity.

Agilent Volatiles Columns

Agilent offers a selection of advanced polymer chemistries for increasingly demanding volatiles applications. Whether for a primary analytical column or as a complementary confirmation column, Agilent J&W capillaries are chromatographers' first choice.

Agilent DB-624 Ultra Inert | Volatile Column

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE
0.18	20	1	-20 to 260	121-1324UI
0.25	30	1.4	-20 to 260	122-1334UI
	60	1.4	-20 to 260	122-1364UI
0.32	30	1.8	-20 to 260	123-1334UI
	60	1.8	-20 to 260	123-1364UI
0.53	30	3	-20 to 260	125-1334UI
	75	3	-20 to 260	125-1374UI

- Excellent for U.S. EPA Methods: 501.3, 502.2, 503.1, 524.2, 601, 602, 8010, 8015, 8020, 8240, 8260
- Pharmaceutical residual solvents per USP <467>
- Ultra inertness processing expands application range with excellent peak shape for low molecular weight acidic compounds

Agilent DB-624 | Volatile Column

Similar Phases: AT-624, Rxi-624 Sil MS, Rtx-624, PE-624, 007-624, 007-502, ZB-624

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE		7890/6890	5975T
				5 IN CAGE	LTM MODULE	LTM TOROID	
0.18	20	1.00	-20 to 280	121-1324	121-1324E	121-1324LTM	221-1324LTM
0.20	25	1.12	-20 to 260	128-1324	128-1324E	128-1324LTM	—
0.25	30	1.40	-20 to 260	122-1334	122-1334E	122-1334LTM	222-1334LTM
	60	1.40	-20 to 260	122-1364	122-1364E	—	—
0.32	30	1.80	-20 to 260	123-1334	123-1334E	123-1334LTM	—
	60	1.80	-20 to 260	123-1364	123-1364E	—	—
0.45	30	2.55	-20 to 260	124-1334	—	—	—
	75	2.55	-20 to 260	124-1374	—	—	—
0.53	15	3.00	-20 to 260	125-1314	—	—	—
	30	3.00	-20 to 260	125-1334	125-1334E	125-1334LTM	—
	60	3.00	-20 to 260	125-1364	125-1364E	—	—
	75	3.00	-20 to 260	125-1374	125-1374E	—	—

- Specifically designed for the analysis of volatile priority pollutants and residual solvents
- No cryogenics needed for U.S. EPA Method 502.2
- Excellent for U.S. EPA Methods: 501.3, 502.2, 503.1, 524.2, 601, 602, 8010, 8015, 8020, 8240, 8260, and USP 467
- Excellent inertness for active compounds
- Bonded and cross-linked
- Solvent rinsable
- Exact replacement of HP-624
- Equivalent to USP Phase G43

Agilent CP-Select 624 CB | Volatile Column

Similar Phases: AT-624, Rtx-624, PE-624, 007-624, 007-502, ZB-624

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.18	25	0.84	265/280	CP7411	—
0.25	30	1.40	265/280	CP7412	—
	60	1.40	265/280	CP7413	—
0.32	30	1.80	265/280	CP7414	—
	60	1.80	265/280	CP7415	—
0.53	30	3.00	265/280	CP7416	CP7416I5
	75	3.00	265/280	CP7417	—
	105	3.00	265/280	CP7418	—

- 6% cyanopropyl, 94% dimethylpolysiloxane
- EPA volatiles methods 524.2, 624 and 8015
- Specified by Pharmacopoeia V.3.3.9 for residual solvents
- Excellent column-to-column reproducibility
- Low bleed

Agilent DB-VRX | Volatile Column

- ➔ Unique selectivity engineered for optimum resolution of volatiles analysis: U.S. EPA Methods 502.2, 524.2 and 8260
- ➔ 0.45 mm ID columns provide more plates per meter compared to 0.53 mm ID columns for the fewest coelutions for GC method (an industry first)*
- ➔ No subambient cooling required to resolve the six "gases"
- ➔ Fast run time: <30 min for optimum sample throughput, <8 min with 0.18 mm ID
- ➔ Low polarity, excellent peak shape
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable

TECH TIP

For a precision cut on your capillary column, use Agilent's GC column cutting tool (5183-4620)

*Two coelutions: 1) *m*- and *p*-xylene, for which U.S. EPA does not require separations, and 2) 1,1,2,2-tetrachloroethane and *o*-xylene which are separated by detectors PID and ELCD, respectively.
Note to GC/MS analysts: These coeluting compounds have different primary characteristic ions of 83 and 106, respectively.

Similar Phases: VOVOL, NON-PAKD, Rtx-Volatiles, PE-Volatiles, 007-624, Rtx-VRX, Rtx-VGC

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE	5975T LTM TOROID	INTUVO
0.18	20	1.00	-10 to 260	121-1524	—	121-1524LTM	221-1524LTM	—
	40	1.00	-10 to 260	121-1544	121-1544E	—	—	—
0.25	30	1.40	-10 to 260	122-1534	—	122-1534LTM	222-1534LTM	—
	60	1.40	-10 to 260	122-1564	122-1564E	—	—	122-1564-INT
0.32	30	1.80	-10 to 260	123-1534	—	—	—	—
	60	1.80	-10 to 260	123-1564	—	—	—	—
0.45	30	2.55	-10 to 260	124-1534	—	—	—	—
	75	2.55	-10 to 260	124-1574	—	—	—	—

Agilent HP-VOC | Volatile Column

Similar Phases: NON-PAKD, Rtx-Volatiles, PE-Volatiles, 007-624, Rtx-VRX, Rtx-VGC

ID (mm)	LENGTH (m)	FILM (µm)	TEMP LIMITS (°C)	7 IN CAGE	5975T LTM TOROID
0.20	30	1.10	-60 to 280/290	19091R-303	29091R-303LTM
	60	1.10	-60 to 280/290	19091R-306	—
0.32	60	1.80	-60 to 280/290	19091R-316	—
	90	1.80	-60 to 280/290	19091R-319	—
0.53	90	3.00	-60 to 280/290	19095R-429	—
	105	3.00	-60 to 280/290	19095R-420	—

- ➔ Selectivity engineered for U.S. EPA Methods 502.2, 524.2 and 8260
- ➔ Low polarity – slightly more polar than DB-VRX
- ➔ Excellent peak shape
- ➔ Bonded and cross-linked
- ➔ Solvent rinsable



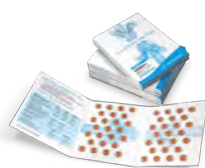
CHROM TECH RELATED PRODUCTS



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Agilent Food, Flavors and Fragrances Columns

Food and flavor analyses place stringent demands on capillary columns. Samples have many components that are difficult to resolve and column-to-column reproducibility becomes critical. Agilent J&W GC columns are ideal for meeting these needs. The rigorous quality control specifications and extensive QC testing ensure that the column you buy today will perform just like the column you buy tomorrow.

Agilent HP-88 | Food, Flavors & Fragrances Column

Similar Phases: SP-2560, SP-2340, SP-2330, BPX-70, BPX-90

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7890/6890			
				7 IN CAGE	5 IN CAGE	LTM MODULE	INTUVO
0.25	100	0.25	0 to 250/260	112-88A7	112-88A7E	—	—
	60	0.20	0 to 250/260	112-8867	112-8867E	—	112-8867-INT
	30	0.20	0 to 250/260	112-8837	112-8837E	112-8837LTM	—

- ➔ (88%-Cyanopropyl)aryl-polysiloxane
- ➔ High polarity
- ➔ Designed for separation of cis-trans fatty acid methyl esters (FAMES)
- ➔ Even better separation than DB-23 of cis-trans isomers

Agilent CP-Sil 88 | Food, Flavors & Fragrances Column

Similar Phases: SP-2560, SP-2340, SP-2330, BPX-70, BPX-90

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE
0.25	25	0.20	50 to 225/240	CP6172
	50	0.20	50 to 225/240	CP6173
0.32	25	0.20	50 to 225/240	CP6174
	50	0.20	50 to 225/240	CP6175

- ➔ High selectivity towards positional and geometric isomers for ease-of-use
- ➔ Highly substituted cyanopropyl phase
- ➔ Highest polarity, non-chemically bonded and stabilized

Agilent Select Fame | Food, Flavors & Fragrances Column

ID (mm)	LENGTH (m)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.25	50	275/290	CP7419	CP7419I5
	100	275/290	CP7420	—
	200	275/290	CP7421	—

- ➔ Optimized for cis-trans separation of FAMES, especially C₁₈ isomers
- ➔ Excellent peak shape and separation for FAME isomers—especially if one component is present at a higher concentration
- ➔ Bonded and cross-linked

Agilent CP-Sil 88 for FAME | Food, Flavors & Fragrances Column

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE
0.25	50	0.20	225/240	CP7488
	60	0.20	225/240	CP7487
	100	0.20	225/240	CP7489

- ➔ Optimized for analysis of FAME cis/trans isomers
- ➔ Use for FAME separation in the C₆ to C₂₆ range

Agilent CP-Wax 57 CB | Food, Flavors & Fragrances Column

Similar Phases: SUPELCOWAX 10, SUPEROX II, CB-WAX, Stabilwax, BP-20, 007-CW, Carbowax, Rtx-WAX, ZB-WAX

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.15	15	0.12	20 to 200/225	—	CP9771115
	30	0.12	20 to 200/225	CP97721	—
0.25	25	0.20	20 to 200/225	CP97713	—
	50	0.20	20 to 200/225	CP97723	CP9772315
	60	0.40	20 to 200/225	CP8120	—
0.32	25	0.20	20 to 200/225	CP97743	—
		1.20	20 to 200/225	CP97763	—
	50	0.20	20 to 200/225	CP97753	CP9775315
		1.20	20 to 200/225	CP97773	—
0.53	25	1.00	20 to 200/225	CP97638	—
	25	2.00	20 to 200/225	CP97658	—

- ➔ Unique high polarity bonded wax column
- ➔ Industry proven for the analysis of alcohols in the brewing and wine/spirits industry
- ➔ Excellent inertness for optimum peak shape of alcohols & glycols
- ➔ Offered in 0.15 mm ID for significantly high speed throughput

Agilent CycloSil-B | Food, Flavors & Fragrances Column

Similar Phases: LIPODEX C, Rt-β DEXm, β-DEX 110, β-DEX 120

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	7890/6890 LTM MODULE
0.25	30	0.25	35 to 260/280	112-6632	112-6632LTM
0.32	30	0.25	35 to 260/280	113-6632	—

Because CycloSil-B GC columns are not bonded or cross-linked, we do not recommend solvent rinsing.

- ➔ 30% heptakis (2,3-di-O-methyl-6-O-t-butyl dimethylsilyl)-β-cyclodextrin in DB-1701
- ➔ Chiral separations without chiral-specific derivatization
- ➔ Ideal for many chiral γ-lactones and terpenes

Agilent Cyclodex-B | Food, Flavors & Fragrances Column

Similar Phases: LIPODEX C, Rt-β DEXm, β-DEX 110, β-DEX 120

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.25	30	0.25	50 to 230/250	112-2532	112-2532E	112-2532LTM
	60	0.25	50 to 230/250	112-2562	—	—
0.32	30	0.25	50 to 230/250	113-2532	113-2532E	—

Because Cyclodex-B GC columns are not bonded or cross-linked, we do not recommend solvent rinsing.

- ➔ 10.5% β-cyclodextrin in DB-1701
- ➔ Chiral separation without chiral-specific derivatization
- ➔ Broad range of resolving potential
- ➔ Excellent peak shape

Agilent HP-Chiral β | Food, Flavors & Fragrances Column

Similar Phases: LIPODEX C, Rt-β DEXm, β-DEX 110, β-DEX 120

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
HP-CHIRAL 10β					
0.25	30	0.25	30 to 240/250	19091G-B133	—
HP-CHIRAL 20β					
0.25	30	0.25	30 to 240/250	19091G-B233	19091G-B233E
0.32	30	0.25	30 to 240/250	19091G-B213	—

- ➔ β-cyclodextrin in (35%-Phenyl)-methylpolysiloxane
- ➔ Chiral separations without chiral-specific derivatization
- ➔ Phenyl-based polymer provides low bleed and does not interfere with nitrogen-specific detectors
- ➔ Available in two concentrations of β-cyclodextrin: 10% and 20%
- ➔ 20% β-cyclodextrin best choice for initial screening

Agilent CP-Chirasil Val | Food, Flavors & Fragrances Column

- ➔ Designed for separation of optically active compounds including amino acids
- ➔ Both antipode phases are available (D and L) for maximum versatility
- ➔ Stabilized chiral phase, over 50% cross-linked for longevity
- ➔ Tested for separation of amino acid enantiomers
- ➔ Low bleed

DESCRIPTION	ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
Antipode D	0.25	25	0.08	200/200	CP7494	—
Antipode L	0.25	25	0.12	200/200	CP7495	CP7495I5

TECH TIP

On Chirasil-L Val, D-amino acids elute before the L-amino acids, while on Chirasil-D-Val, this elution order is reversed. This is especially valuable when determining the optical purity of these compounds. Selecting the column from which the minor compound elutes before the major enantiomers results in the lowest detection levels.

Agilent CP-Chirasil-Dex CB | Food, Flavors & Fragrances Column

Similar Phases: LIPODEX C, Rt-β DEXm, β-DEX 110, β-DEX 120

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.25	25	0.25	200/200	CP7502	CP7502I5
0.32	25	0.25	200/200	CP7503	—

- ➔ No need for derivatization improved productivity
- ➔ Low elution temperature of polar compounds
- ➔ Cyclodextrin bonded to dimethylpolysiloxane for homogeneous enantioselectivity throughout the column

Agilent Life Sciences Columns

The life sciences offer some difficult challenges to capillary GC chromatographers. These include complex sample matrices, the necessity for low level detection and the chemically active characteristics of many of the samples. In response to this, Agilent offers a line of columns which are designed specifically for drug of abuse testing.

Agilent DB-ALC1 and DB-ALC2 | Life Sciences Column

Similar Phases: Rtx-BAC1, Rtx-BAC2, ZB-BAC-1, ZB-BAC-2

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	INTUVO
DB-ALC1						
0.32	30	1.80	20 to 260/280	123-9134	—	123-9134-INT
0.53	30	3.00	20 to 260/280	125-9134	125-9134E	—
DB-ALC2						
0.32	30	1.20	20 to 260/280	123-9234	123-9234E	123-9234-INT
0.53	30	2.00	20 to 260/280	125-9234	—	—

- ➔ Reliable blood alcohol analysis
- ➔ Optimized primary and confirmation column pair for U.S. blood alcohol analysis
- ➔ Improved resolution of key ethanol/acetone peaks
- ➔ Bonded and cross-linked

Agilent HP-Blood Alcohol | Life Sciences Column

Similar Phases: Aucune

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.32	7.5	2.00	-60 to 270/290	19091S-510	19091S-510E

- ➔ Reliable blood alcohol analysis
- ➔ Excellent confirmation column with DB-ALC2 for method using t-butanol as internal standard

Agilent DB-5ms EVDX | Life Sciences Column

- Specially configured and tested for drugs of abuse confirmation
- Drug test mix included: caffeine, glutethimide, lidocaine, phenobarbital, EDDP, methaqualone, methadone, cocaine, desipramine, carbamazepine
- DB-5ms EVDX is equivalent to (5%-Phenyl)-methylpolysiloxane
- Consistent retention and peak shape
- Low bleed for GC/MS analysis
- Bonded and cross-linked
- Solvent rinsable

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE
0.20	25	0.33	-60 to 325/350	128-8522



Agilent Certified Vials, page 18

Agilent DB-Select 624 UI for <467> | Life Sciences Column

- Engineered to optimize pharmaceutical residual solvents analysis per USP Method <467>
- Ultra Inertness and low bleed
- Resolution of USP regulated critical pairs, also separates benzene and 1,2-dichloroethane
- Identical selectivity to the popular VF-624 ms – upgrade with no changes in method.
- UI testing ensures premium performance column to column

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE
0.25	30	1.4	-40 to 280/300	122-0334UI
	60	1.4	-40 to 280/300	122-0364UI
			-40 to 280/300	123-0334UI
0.32	60	1.8	-40 to 280/300	123-0364UI
	30	1.8	-40 to 280/300	125-0334UI

Agilent HP-Fast Residual Solvent | Life Sciences Column

- Equivalent to USP Phase G43
- Thinner film reduces run time by 2.5 times and increases Minimum Detection Limit (MDL) by 2 times compared to standard film thickness used for this method
- Bonded and cross-linked

Similar Phases: PE-624, 007-624, 007-502, ZB-624

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.53	30	1.00	-20 to 260	19095V-420	19095V-420E	19095V-420LTM



UltiMetal Plus Ultimate Union, page 371
Leak-free connection of guard columns or retention gaps



Agilent Certified Vials, page 18

Agilent Metal Columns

DB-ProSteel and UltiMetal columns are engineered to combine the robustness of stainless steel with advanced surface deactivation for excellent peak shape.

- ➔ Configured for high temp analyses such as simulated distillation
- ➔ Wide variety of stationary phases and configurations available
- ➔ Ideal for portable and process GC applications
- ➔ Superior replacement for MXT/Silco-steel columns

PHASE	ID (mm)	LENGTH (m)	FILM (µm)	7 IN CAGE	5 IN CAGE
SIMULATED DISTILLATION/HIGH TEMPERATURE					
DB-HT SimDis	0.53	5	0.10	145-1009	—
			0.15	145-1001	—
DB-PS2887	0.53	10	3.00	145-2814	—
CP-SimDist UltiMetal	0.53	5	0.09	CP7569	CP756915
			0.17	CP7532	CP753215
			0.88	CP7570	—
			2.65	CP7571	—
			10	0.06	CP6540
		0.17	CP7542	—	
		0.53	CP7592	—	
		0.88	CP7512	—	
		1.20	CP7562	—	
		2.65	CP7582	—	
		5.00	CP7572	—	
		20	0.11	CP7593	—
		25	0.06	CP6550	—
		VF-5ht UltiMetal	0.25	15	0.10
0.32	CP9094				CP909415
30	0.10			CP9092	—
	0.32			CP9096	—
VF-5ht UltiMetal with Retention Gap UltiMetal	0.25	15	0.10	CP9091	—
			0.32	CP9095	—
		30	0.10	CP9093	—
			0.32	CP9097	—

PHASE	ID (mm)	LENGTH (m)	FILM (µm)	7 IN CAGE	5 IN CAGE	
STANDARD PHASES AND PEG						
DB-PS1	0.53	15	0.15	145-1011	—	
CP-Sil 5 CB	0.53	10	2.00	CP7150	—	
			5.00	CP6666	—	
			25	0.50	CP7135	—
			1.00	CP7130	—	
			2.00	CP7160	—	
		5.00	CP6670	—		
		50	1.00	CP7140	—	
		2.00	CP7170	—		
		5.00	CP6671	—		
		CP-Sil 8 CB UltiMetal	0.53	25	5.00	CP6680
50	5.00			CP7196	—	
				CP6681	—	
CP-Sil 13 CB UltiMetal	0.53	25	1.00	CP7141	—	
DB-PSWAX	0.53	30	1.00	145-7032	—	
CP-WAX 52 CB UltiMetal	0.53	10	1.00	CP7148	—	
			2.00	CP7177	—	
			25	0.50	CP7138	—
		50	2.00	CP7178	—	
			0.50	CP7198	—	
			1.00	CP7168	—	
			2.00	CP7179	—	
PLOT COLUMNS						
PoraPLOT Q UltiMetal	0.53	10	20.00	CP6953	—	
		25	20.00	CP6954	—	
CP-AI203/KCl UltiMetal	0.53	50	10.00	CP6918	—	
CP-AI203/Na ₂ SO ₄ UltiMetal	0.53	50	10.00	CP6968	—	
CP-Molsieve 5Å UltiMetal	0.53	10	50.00	CP6937	—	
		25	50.00	CP6938	CP693815	
SELECT APPLICATION COLUMNS						
DB-PS624	0.53	30	3.00	145-1334	—	
CP-Sil PAH CB UltiMetal	0.25	25	0.12	CP7440	—	
CP-TAP CB	0.25	25	0.10	CP7463	—	
Select Biodiesel w/retention gap	0.32	10	0.10	CP9076	—	
		15	0.10	CP9078	—	
Select Biodiesel	0.32	10	0.10	CP9077	—	
		15	0.10	CP9079	—	

Agilent PLOT Columns

PLOT columns are ideal for separating compounds that are gases at room temperatures. Agilent Technologies offers a comprehensive line of PLOT columns for analysis of fixed gases, low molecular weight hydrocarbon isomers, volatile polar compounds and reactive analytes such as sulfur gases, amines and hydrides. Our PLOT phases are offered in dimensions from 0.25 to 0.53 mm ID, allowing for easy column selection for various detector and system requirements. For GC/MS systems, we offer several small diameter columns with truly bonded and immobilized stationary phases, eliminating potential detector fouling due to particle generation.

Agilent PoraBOND Q | Plot Column

Similar Phases: Rt-Q BOND, Rt-QPLOT, SupelQ PLOT

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.25	10	3.00	-100 to 300/300	CP7347	—
	25	3.00	-100 to 300/320	CP7348	CP7348I5
0.32	10	5.00	-100 to 300/320	CP7350	CP7350I5
	25	5.00	-100 to 300/320	CP7351	CP7351I5
	50	5.00	-100 to 300/320	CP7352	CP7352I5
0.53	10	10.00	-100 to 300/320	CP7353	CP7353I5
	25	10.00	-100 to 300/320	CP7354	CP7354I5
	50	10.00	-100 to 300/320	CP7355	—

- ➔ Bonded for more reliable results for analysis of volatile solvents and hydrocarbons
- ➔ Engineered for high stability, withstands repeated water injections
- ➔ Bonding technology results in greatly reduce particle shedding, reduces the needs for particle traps

Agilent HP-PLOT Q | Plot Column

Similar Phases: Rt-QPLOT, SupelQ PLOT

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.32	15	20.00	-60 to 270/290	19091P-QO3	—	19091P-QO3LTM
	30	20.00	-60 to 270/290	19091P-QO4	19091P-QO4E	19091P-QO4LTM
0.53	15	40.00	-60 to 270/290	19095P-QO3	19095P-QO3E	19095P-QO3LTM
	30	40.00	-60 to 270/290	19095P-QO4	19095P-QO4E	19095P-QO4LTM

- ➔ Excellent column for C₁ to C₃ isomers and alkanes to C₁₂, CO₂, methane, air/CO, oxygenated compounds, sulfur compounds and solvents
- ➔ Separates ethane, ethylene and ethyne (acetylene)
- ➔ Minimal conditioning time required—1 hour

Agilent GS-Q | Plot Column

Similar Phases: Rt-QPLOT, SupelQ PLOT

ID (mm)	LENGTH (m)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.32	30	-60 to 250	113-3432	113-3432E
0.53	10	-60 to 250	115-34H2	—
	15	-60 to 250	115-3412	—
	25	-60 to 250	115-3422	—
	30	-60 to 250	115-3432	115-3432E

- ➔ Porous divinylbenzene homopolymer
- ➔ Polarity between Porapak-Q and Porapak-N
- ➔ Separates ethane, ethylene and ethyne (acetylene)
- ➔ Not recommended for quantification of polar compounds
- ➔ Minimal conditioning time required—1 hour

Agilent PoraPLOT Q and PoraPLOT Q-HT | Plot Column

Similar Phases: Rt-Q BOND, Rt-QPLOT, SupelQ PLOT

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.25	10	8.00	-100 to 250/250	CP7548	—
	25	8.00	-100 to 250/250	CP7549	—
0.32	10	10.00	-100 to 250/250	CP7550	CP7550I5
	25	10.00	-100 to 250/250	CP7551	CP7551I5
	50	10.00	-100 to 250/250	CP7552	—
0.53	10	20.00	-100 to 250/250	CP7553	—
	25	20.00	-100 to 250/250	CP7554	CP7554I5
	50	20.00	-100 to 250/250	CP7555	—
PORAPLOT Q ULTIMETAL					
0.53	10	20.00	-100 to 250/250	CP6953	CP6953I5
	25	20.00	-100 to 250/250	CP6954	CP6954I5
	50	20.00	-100 to 250/250	CP6955	—
PORAPLOT Q-HT					
0.32	10	10.00	-100 to 290/290	CP7556	—
	25	10.00	-100 to 290/290	CP7557	—
0.53	10	20.00	-100 to 290/290	CP7558	—
	25	20.00	-100 to 290/290	CP7559	—

- Recommended for column switching systems that analyze a broad range of polar and apolar volatile compounds
- Water elutes as a sharp peak enabling quantitation
- Retention of target compounds is not influenced by water in the sample
- Long term stability provides repeatable retention times
- Available in Fused Silica and UltiMetal

Agilent HP-PLOT U | Plot Column

Similar Phases: RTU PLOT

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.32	30	10.00	-60 to 190	19091P-UO4	19091P-UO4E	19091P-UO4LTM
0.53	15	20.00	-60 to 190	19095P-UO3	—	—
	30	20.00	-60 to 190	19095P-UO4	19095P-UO4E	19095P-UO4LTM

- Excellent column for C₁ to C₇ hydrocarbons, CO₂, methane, air/CO, water, oxygenates, amines, solvents, alcohols, ketones, and aldehydes

Agilent PoraPLOT U and PoraPLOT S | Plot Column

PoraPLOT U

Similar Phases: Rt-U-BOND

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE
0.25	25	8.00	-100 to 190/190	CP7579
0.32	10	10.00	-100 to 190/190	CP7580
	25	10.00	-100 to 190/190	CP7581
0.53	10	20.00	-100 to 190/190	CP7583
	25	20.00	-100 to 190/190	CP7584

- The most polar porous polymer PLOT column ideal for halogenated compounds, C₁-C₆ hydrocarbons, ketones and solvents
- Water has no effect on retention times and elutes as a sharp quantifiable peak

PoraPLOT S

Similar Phases: Rt-S-BOND, MXT-SBOND

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE
0.53	25	20.00	-100 to 250/250	CP7574

- Ideal for the analysis of medium polarity volatile including hydrocarbons and ketones

Agilent HP-PLOT Al₂O₃ KCl | Plot Column

Similar Phases: Rt-Alumina PLOT, Alumina PLOT, Al₂O₃/KCl, AB-PLOT Al₂O₃ KCl, AT-Alumina

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.25	30	5.00	-60 to 200	19091P-K33	—	19091P-K33LTM
0.32	50	8.00	-60 to 200	19091P-K15	19091P-K15E	—
0.53	30	15.00	-60 to 200	19095P-K23	—	19095P-K23LTM
	50	15.00	-60 to 200	19095P-K25	19095P-K25E	—

- ➔ Least "polar" Alumina phase
- ➔ Standard column choice for light hydrocarbon analysis—C₁ to C₈ hydrocarbon isomers
- ➔ Low retention of olefins relative to comparable paraffin
- ➔ Excellent for quantitation of dienes, especially propadiene and butadiene from ethylene and propylene streams

Agilent GS-Alumina KCl | Plot Column

Similar Phases: Al₂O₃/KCl, Al₂O₃/Na₂SO₄, Rt-Alumina PLOT, Alumina PLOT, AB-PLOT Al₂O₃ KCl, AT-Alumina

ID (mm)	LENGTH (m)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.53	30	-60 to 200	115-3332	—
	50	-60 to 200	115-3352	115-3352E

- ➔ Least "polar" Alumina phase
- ➔ Aluminum oxide deactivated with KCl
- ➔ Good choice for light hydrocarbon analysis
- ➔ Good resolution of propadiene and butadiene from ethylene and propylene streams

Agilent HP-PLOT Al₂O₃ S | Plot Column

Similar Phases: Al₂O₃/Na₂SO₄, Rt-Alumina PLOT, Alumina PLOT, Rt-Alumina BOND/Na₂SO₄, MXT-AluminaBOND/Na₂SO₄, Alumina sulfate PLOT, AT-Alumina

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.25	30	5.00	-60 to 200	19091P-S33	—	—
0.32	25	8.00	-60 to 200	19091P-S12	—	19091P-S12LTM
	50	8.00	-60 to 200	19091P-S15	19091P-S15E	—
0.53	15	15.00	-60 to 200	19095P-S21	—	—
	30	15.00	-60 to 200	19095P-S23	—	—
	50	15.00	-60 to 200	19095P-S25	19095P-S25E	—

- ➔ Middle range of "polarity" for Alumina phases
- ➔ Aluminum oxide deactivated with sodium sulfate
- ➔ Excellent general use column for light hydrocarbon analysis—C₁ to C₈ hydrocarbon isomers
- ➔ Best for resolving acetylene from butane and propylene from isobutane

Agilent CP-Al₂O₃/KCl and CP-Al₂O₃/Na₂SO₄ | Plot Column

CP-Al₂O₃/KCl

Similar Phases: Al₂O₃/KCl, Rt-Alumina PLOT, Alumina PLOT, RT-Alumina Bond/KCl, Alumina chloride PLOT, AB-PLOT Al₂O₃ KCl

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.25	25	4.00	-100 to 200/200	CP7576	—
	50	4.00	-100 to 200/200	CP7577	—
0.32	10	5.00	-100 to 200/200	CP7511	—
	50	5.00	-100 to 200/200	CP7515	CP751515
	25	5.00	-100 to 200/200	CP7519	—
0.53	25	10.00	-100 to 200/200	CP7517	—
	50	10.00	-100 to 200/200	CP7518	—
CP-AL₂O₃/KCL ULTIMETAL					
0.53	50	10.00	-100 to 200/200	CP6918	—

- ➔ Aluminum oxide PLOT columns offer high selectivity for separating ppm levels of C₁-C₅ hydrocarbons in process streams
- ➔ No need for sub-ambient cooling

CP-Al₂O₃/Na₂SO₄

Similar Phases: Al₂O₃/Na₂SO₄, Rt-Alumina PLOT, Alumina PLOT, Rt-Alumina BOND/Na₂SO₄, MXT-AluminaBOND/Na₂SO₄, Alumina sulfate PLOT

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.25	25	4.00	-100 to 200/200	CP7586	—
	50	4.00	-100 to 200/200	CP7587	—
0.32	50	5.00	-100 to 200/200	CP7565	CP756515
0.53	25	10.00	-100 to 200/200	CP7567	—
	50	10.00	-100 to 200/200	CP7568	—
CP-AL₂O₃/NA₂SO₄ ULTIMETAL					
0.53	50	10.00	-100 to 200/200	CP6968	—

TECH TIP

Aluminum oxide PLOT columns are deactivated using KCl or Na₂SO₄ treatments which provides a reproducible and stable deactivation up to 200 °C. The KCl salt deactivation results in a relatively apolar Al₂O₃ surface, while the Na₂SO₄ deactivation provides a polar surface. Unsaturated compounds such as ethylene and acetylene (ethyne) are retained longer.

Agilent GS-Alumina | Plot Column

- ➔ Most "polar" Alumina phase
- ➔ Aluminum oxide with proprietary deactivation
- ➔ Excellent general use column for light hydrocarbon analysis—C₁ to C₈ hydrocarbon isomers
- ➔ Separates C₁ to C₄ saturated and unsaturated hydrocarbons
- ➔ Best for resolving cyclopropane from propylene
- ➔ Faster, more efficient and provides more sensitivity than packed equivalents
- ➔ Minimal conditioning time required
- ➔ Preferred substitution for sodium sulfate deactivated Alumina because of its regenerative nature

Similar Phases: Al₂O₃/KCl, Al₂O₃/Na₂SO₄, Rt-Alumina PLOT, Alumina PLOT, AB-PLOT Al₂O₃KCl, AT-Alumina

ID (mm)	LENGTH (m)	TEMP LIMITS (°C)	7 IN CAGE
0.53	30	-60 to 200	115-3532
	50	-60 to 200	115-3552

TECH TIP

Alumina columns have a tendency to adsorb water and CO₂ which, over time, results in changes in retention time. We use an advanced, proprietary deactivation process which allows for rapid regeneration. Fully water saturated GS-Alumina columns regenerate in 7 hours or less at 200 °C.

Agilent HP-PLOT Al₂O₃ M | Plot Column

- ➔ Most "polar" Alumina phase (similar to GS-Alumina)
- ➔ Aluminum oxide deactivated with proprietary deactivation
- ➔ Good general use column for light hydrocarbon analysis—C₁ to C₈ hydrocarbon isomers
- ➔ Good for resolving acetylene from butane and propylene from isobutane

Similar Phases: AB-PLOT Al₂O₃ M, BGB-PLOT Al₂O₃ M, AT-Alumina

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.32	50	8.00	-60 to 200	19091P-M15	19091P-M15E
0.53	30	15.00	-60 to 200	19095P-M23	—
	50	15.00	-60 to 200	19095P-M25	—

Agilent GS-GasPro | Plot Column

- ➔ Unique bonded silica PLOT column technology
- ➔ Excellent choice for light hydrocarbons and sulfur gases
- ➔ Retention stability not affected by water
- ➔ Separates CO and CO₂ on a single column
- ➔ Ideal PLOT column for GC/MS—no particles

Similar Phases: CP-Silica PLOT

ID (mm)	LENGTH (m)	TEMP LIMITS (°C)	7 IN CAGE
0.32	5	-80 to 260/300	113-4302
	15	-80 to 260/300	113-4312
	30	-80 to 260/300	113-4332
	60	-80 to 260/300	113-4362

Agilent GS-CarbonPLOT | Plot Column

- ➔ High stability, bonded carbon layer stationary phase
- ➔ Unique selectivity for inorganic and organic gases
- ➔ Extended temperature limit of 360 °C
- ➔ Ideal for GC/MS—no particle generation
- ➔ Retention stability not affected by water

Similar Phases: Carboxen- 1006 PLOT

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	7890/6890 LTM MODULE
0.32	15	1.50	0 to 360	113-3112	—
	30	1.50	0 to 360	113-3132	—
		3.00	0 to 360	113-3133	—
	60	1.50	0 to 360	113-3162	—
0.53	15	3.00	0 to 360	115-3113	—
	30	3.00	0 to 360	115-3133	115-3133LTM



Agilent Premium Non-Stick Septa, page 365

Agilent HP-PLOT Molesieve | Plot Column

- ➔ A PLOT column for the analysis of permanent gases
- ➔ O₂, N₂, CO and CH₄ resolve in less than 5 min
- ➔ Durable molecular sieve 5Å coating minimizes baseline spiking and damage to multiport valves
- ➔ Select a thick film for Ar/O₂ separation without cryogenic cooling
- ➔ Select thin film HP-PLOT Molesieve columns for routine air monitoring applications
- ➔ Replaces GS-Molesieve

Similar Phases: Rt-Msieve 5A, MXT-Msieve 5A

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE	7890/6890 LTM MODULE
0.32	15	25.00	-60 to 300	19091P-MS7	—	19091P-MS7LTM
	30	12.00	-60 to 300	19091P-MS4	19091P-MS4E	—
		25.00	-60 to 300	19091P-MS8	—	19091P-MS8LTM
0.53	15	25.00	-60 to 300	19095P-MS5	—	—
		50.00	-60 to 300	19095P-MS9	—	—
	30	25.00	-60 to 300	19095P-MS6	19095P-MS6E	—
		50.00	-60 to 300	19095P-MS0	19095P-MS0E	19095P-MS0LTM

TECH TIP

Molecular sieve columns will absorb water, which, over time results in changes in retention time. We use an advanced, proprietary deactivation process which allows for rapid regeneration. Fully saturated HP-PLOT Molesieve columns regenerate in 7 hours or less at 200 °C.

Agilent CP-Molsieve 5Å | Plot Column

- ➔ Separate argon and oxygen at ambient temperature to reduce costs
- ➔ High efficiency for increased productivity
- ➔ Symmetrical peaks for accurate results

Similar Phases: Rt-Msieve 5A, MXT-Msieve 5A, Mol Sieve 5A PLOT

ID (mm)	LENGTH (m)	FILM (μm)	TEMP LIMITS (°C)	7 IN CAGE	5 IN CAGE
0.25	25	30.00	-200 to 350/350	CP7533	—
0.32	10	30.00	-200 to 350/350	CP7535	CP7535I5
	25	30.00	-200 to 350/350	CP7536	—
	30	10.00	-200 to 350/350	CP7534	CP7534I5
	50	30.00	-200 to 350/350	CP7540	CP7540I5
0.53	10	50.00	-200 to 350/350	CP7537	—
	15	15.00	-200 to 350/350	CP7543	—
	25	50.00	-200 to 350/350	CP7538	CP7538I5
	30	15.00	-200 to 350/350	CP7544	—
	50	50.00	-200 to 350/350	CP7539	—
CP-MOLSIEVE 5Å ULTIMETAL					
0.53	10	50.00	-200 to 350/350	CP6937	CP6937I5
	25	50.00	-200 to 350/350	CP6938	CP6938I5



CHROM TECH RELATED PRODUCTS



UltiMetal Plus Ultimate Union, page 371
Leak-free connection of guard columns or retention gaps



Agilent Certified Vials, page 18

Restek Rxi® Column Family

Rxi Deactivation

- Effectively shields reactive silanols
- Ensures comprehensive inertness (acids, bases and diols)
- Provides symmetric peaks for higher sensitivity

Rxi Manufacturing

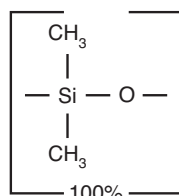
- Tighter quality controls for better performance and reliable column to column reproducibility

Rxi Chemistry

- Rxi Phase Chemistry
- Enhances selectivity for challenging separations.
- Increases thermal stability, widening the application range
- Lowers bleed for MS compatibility
- Surface bonding increases durability and ensures reproducible retention times

Restek Rxi®-1ms Columns

- General-purpose columns for arson accelerants, essential oils, hydrocarbons, pesticides, PCB congeners (ie: Aroclor mixes), sulfur compounds, amines, solvent impurities, simulated distillation, oxygenates, gasoline range organics (GRO), refinery gases
- Tested and guaranteed for ultra-low bleed; improved signal-to-noise ratio for better sensitivity and mass spectral integrity
- Equivalent to USP G1, G2, and G38 phases



(nonpolar phase; Crossbond® dimethyl polysiloxane)

Similar Phases: HP-1ms, HP-1msUI, DB-1ms, DB-1msUI, Ultra-1, VF-1ms, ZB-1, ZB-1ms

ID (mm)	FILM (µm)	TEMP LIMITS (°C)	12 m		
			20 m	50 m	
0.15	0.15	-60 to 330/350	—	RTK-43801	—
	2.0	-60 to 330/350	—	RTK-43802	—
0.18	0.18	-60 to 330/350	—	RTK-13302	—
	0.36	-60 to 330/350	—	RTK-13311	—
0.20	0.33	-60 to 330/350	RTK-13397	RTK-13398 (25 m)	RTK-13399

ID (mm)	FILM (µm)	TEMP LIMITS (°C)	15 m		
			30 m	60 m	
0.15	.015	-60 to 330/350	—	—	—
0.25	0.25	-60 to 330/350	RTK-13320	RTK-13323	RTK-13326
	0.50	-60 to 330/350	RTK-13335	RTK-13338	RTK-13341
	1.00	-60 to 330/350	RTK-13350	RTK-13353	RTK-13356
0.32	0.25	-60 to 330/350	RTK-13321	RTK-13324	RTK-13327
	0.50	-60 to 330/350	RTK-13336	RTK-13339	RTK-13342
	1.00	-60 to 330/350	—	RTK-13354	RTK-13357
	4.00	-60 to 330/350	—	RTK-13396	—
0.53	0.50	-60 to 330/350	RTK-13337	RTK-13340	—
	1.00	-60 to 330/350	RTK-13352	RTK-13355	—
	1.50	-60 to 330/350	RTK-13367	RTK-13370	RTK-13373

Restek Rxi®-XLB Columns

- Low-polarity proprietary phase
- General-purpose columns exhibiting extremely low bleed
- Ideal for many GC-MS applications, including: ion trap detectors, pesticides, PCB congeners (ie: Aroclor mixes), PAHs, semivolatile compounds in drinking water
- Unique selectivity

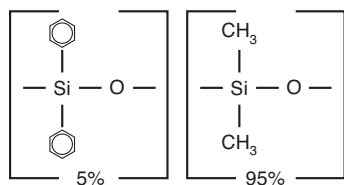
Similar Phases: DB-XLB, VF-Xms, MR1, ZB-XLB

ID (mm)	FILM (µm)	TEMP LIMITS (°C)	15 m		
			30 m	60 m	
0.18	0.18	30 to 340/360	RTK-43702 (20 m)	—	—
0.25	0.10	30 to 340/360	RTK-13705	RTK-13708	—
	0.25	30 to 340/360	RTK-13720	RTK-13723	RTK-13726
	0.50	30 to 340/360	—	RTK-13738	—
	1.00	30 to 340/360	—	RTK-13753	—
0.32	0.25	30 to 340/360	—	RTK-13724	RTK-13727
	0.50	30 to 340/360	—	RTK-13739	—
	1.00	30 to 340/360	—	RTK-13754	—
0.53	0.50	30 to 320/360	—	RTK-13740	—

*Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

Restek Rxi[®]-5ms Columns

- General-purpose columns for semivolatiles, phenols, amines, residual solvents, drugs of abuse, pesticides, PCB congeners (ie: Aroclor mixes), solvent impurities
- Tested and guaranteed for ultra-low bleed; improved signal-to-noise ratio for better sensitivity and mass spectral integrity
- Equivalent to USP G27 and G36 phases



(low-polarity phase; Crossbond[®] diphenyl dimethyl polysiloxane)

Similar Phases: HP-5ms SemiVolatiles, HP-5ms, HP-5msUI, DB-5, Ultra-2, CP-Sil 8 CB, ZB-5msi

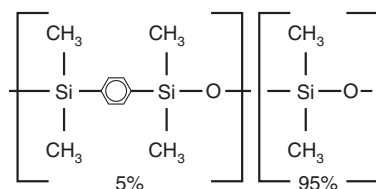
ID (mm)	FILM (μm)	TEMP LIMITS (°C)	Length		
			12 m	20 m	50 m
0.18	0.18	-60 to 330/350	—	RTK-13402	—
	0.30	-60 to 330/350	—	RTK-13409	—
	0.36	-60 to 330/350	—	RTK-13411	—
0.20	0.33	-60 to 330/350	RTK-13497	RTK-13498 (25 m)	RTK-13499

ID (mm)	FILM (μm)	TEMP LIMITS (°C)	Length		
			15 m	30 m	60 m
0.25	0.25	-60 to 330/350	RTK-13420	RTK-13423	RTK-13426
	0.40	-60 to 330/350	—	RTK-13481	—
	0.50	-60 to 330/350	RTK-13435	RTK-13438	RTK-13441
	1.00	-60 to 330/350	RTK-13450	RTK-13453	RTK-13456
0.32	0.25	-60 to 330/350	RTK-13421	RTK-13424	RTK-13427
	0.50	-60 to 330/350	RTK-13436	RTK-13439	RTK-13442
	1.00	-60 to 330/350	RTK-13451	RTK-13454	RTK-13457
0.53	0.25	-60 to 330/350	RTK-13422	RTK-13425	—
	0.50	-60 to 330/350	RTK-13437	RTK-13440	—
	1.00	-60 to 330/350	RTK-13452	RTK-13455	—
	1.50	-60 to 330/350	RTK-13467	RTK-13470	—

Restek Rxi[®]-5Sil MS Columns

- Excellent inertness for active compounds
- General-purpose columns—ideal for GC-MS analysis of semivolatiles, polycyclic aromatic compounds, chlorinated hydrocarbons, phthalates, phenols, amines, organochlorine pesticides, organophosphorus pesticides, drugs, solvent impurities, and hydrocarbons

The Rxi[®]-5Sil MS stationary phase incorporates phenyl groups in the polymer back-bone. This improves thermal stability, reduces bleed, and makes the phase less prone to oxidation. Rxi[®]-5Sil MS columns are ideal for GC-MS applications requiring high sensitivity, including use in ion trap systems.



(low-polarity phase; Crossbond[®] 1,4-bis(dimethylsiloxy)phenylene dimethyl polysiloxane)

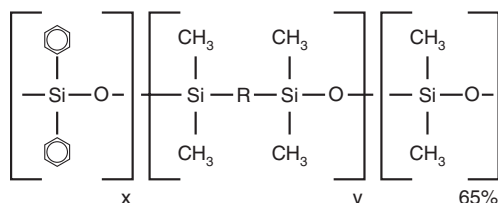
Similar Phases: DB-5ms, DB-5msUI, VF-5ms, ZB-5ms, ZB-SemiVolatiles, Rxi-5Sil MS

ID (mm)	FILM (μm)	TEMP LIMITS (°C)	Length		
			10 m	20 m	60 m
0.15	0.15	-60 to 320/350	RTK-43815	RTK-43816	—
	2.0	-60 to 320/350	—	RTK-43817	—
0.18	0.10	-60 to 320/350	—	—	RTK-43607
	0.18	-60 to 320/350	—	RTK-43602	RTK-43605 (40 m)
	0.36	-60 to 320/350	—	RTK-43604	—

ID (mm)	FILM (μm)	TEMP LIMITS (°C)	Length		
			15 m	30 m	60 m
0.25	0.10	-60 to 320/350	RTK-13605	RTK-13608	—
	0.25	-60 to 320/350	RTK-13620	RTK-13623	RTK-13626
	0.50	-60 to 320/350	RTK-13635	RTK-13638	—
	1.00	-60 to 320/350	RTK-13650	RTK-13653	RTK-13697
0.32	0.25	-60 to 320/350	RTK-13621	RTK-13624	—
	0.50	-60 to 320/350	—	RTK-13639	—
	1.00	-60 to 320/350	—	RTK-13654	—
0.53	1.50	-60 to 320/330	—	RTK-13670	—

Restek Rxi[®]-35Sil MS Columns

- Special selectivity and excellent inertness for substituted polar compounds, such as drugs, pesticides, herbicides, PCBs, phenols, etc
- Provides superior separation for cannabinoids



(midpolarity Crossbond[®] phase)

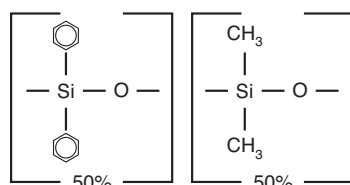
Similar Phases: DB-35ms, DB-35msUI, VF-35ms, MR2

ID (mm)	FILM (μm)	TEMP LIMITS* (°C)	15 m	30 m
0.25	0.25	50 to 340/360	RTK-13820	RTK-13823
	0.50	50 to 340/360	RTK-13835	RTK-13838
	1.00	50 to 320/340	RTK-13850	RTK-13853
0.32	0.25	50 to 340/360	RTK-13821	RTK-13824
	0.50	50 to 340/360	RTK-13836	RTK-13839
	1.00	50 to 320/340	RTK-13851	RTK-13854
0.53	0.50	50 to 340/360	RTK-13837	—
	1.00	50 to 325/340	RTK-13852	RTK-13855
	1.50	50 to 310/330	RTK-13856	RTK-13857
	3.00	50 to 280/300	RTK-13858	RTK-13859

*Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

Restek Rxi[®]-17 Columns

- General-purpose columns for pesticides, herbicides, rosin acids, phthalate esters, triglycerides, sterols



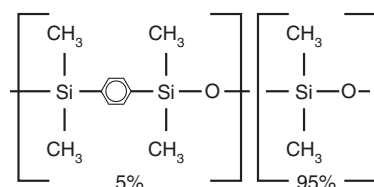
(midpolarity phase; Crossbond[®] diphenyl dimethyl polysiloxane)

Similar Phases: HP-17, DB-17, DB-17ht, DB-608, ZB-50

ID (mm)	FILM (μm)	TEMP LIMITS (°C)	15 m	30 m
0.18	0.18	40 to 280/320	RTK-13502 (20m)	—
0.25	0.25	40 to 280/320	RTK-13520	RTK-13523
	0.50	40 to 280/320	—	RTK-13538
	1.00	40 to 280/320	—	RTK-13553
0.32	0.25	40 to 280/320	—	RTK-13524
	0.50	40 to 280/320	—	RTK-13539
	1.00	40 to 280/320	—	RTK-13554
0.53	0.25	40 to 280/320	—	RTK-13525
	0.50	40 to 280/320	—	RTK-13540
	0.83	40 to 280/320	—	RTK-13569
	1.00	40 to 280/320	RTK-13552	RTK-13555
	1.50	40 to 280/320	—	RTK-13570

Restek Rxi[®]-17Sil MS Columns

- Excellent inertness and selectivity for active environmental compounds, such as PAHs
- Equivalent to USP phase G3



(midpolarity Crossbond[®] phase)

Similar Phases: DB-17ms, VF-17ms

ID (mm)	FILM (μm)	TEMP LIMITS (°C)	10 m	20 m
0.15	0.15	40 to 340/360	RTK-43820	RTK-43821
0.18	0.18	40 to 340/360	—	RTK-14102
	0.36	40 to 340/360	—	RTK-14111
ID (mm)	FILM (μm)	TEMP LIMITS* (°C)	15 m	30 m
0.25	0.25	40 to 340/360	RTK-14120	RTK-14123
0.32	0.25	40 to 340/360	RTK-14121	RTK-14124

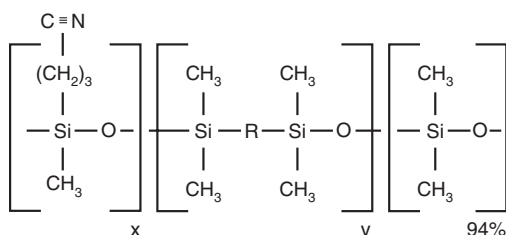
Restek Rxi®-PAH Columns

- Midpolarity proprietary phase
- Ideal for EFSA PAH4 analysis—separates all priority compounds: benz[a] anthracene, chrysene, benzo[b] fluoranthene, and benzo[a]pyrene
- Best resolution of chrysene from interfering PAHs, triphenylene, and cyclopenta[cd]pyrene
- Complete separation of benzo [b], [k], [j], and [a] fluoranthenes
- 360 °C thermal stability allows analysis of low-volatility dibenzo pyrenes

ID (mm)	FILM (µm)	TEMP LIMITS* (°C)	30 m	60 m
0.18	0.07	to 360	RTK-49316 (40 m)	—
0.25	0.10	to 360	RTK-49318	RTK-49317

Restek Rxi®-624Sil MS Columns

- Selective—G43 phase highly selective for volatile organics and residual solvents, great choice for USP<467>



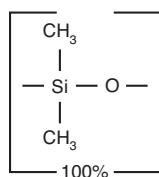
(midpolarity Crossbond® phase)

Similar Phases: DB-624, VF-624ms, CP-Select 624 CB

ID (mm)	FILM (µm)	Temp Limits (°C)	30 m	60 m
0.18	1.00	-20 to 300/320	RTK-13865 (20 m)	—
0.25	1.40	-20 to 300/320	RTK-13868	RTK-13869
0.32	1.80	-20 to 300/320	RTK-13870	RTK-13872
0.53	3.00	-20 to 280/300	RTK-13871	RTK-13873

Restek Rxi®-1HT Columns

- 40% longer lifetime from specially designed fused silica tubing
- Columns processed for high-temperature applications, such as high molecular weight hydrocarbons



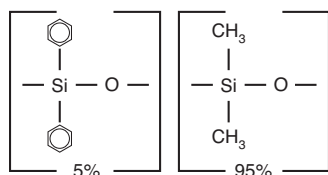
(nonpolar phase; dimethyl polysiloxane)

Similar Phases: DB-1ht, ZB-1HTinferno

ID (mm)	FILM (µm)	TEMP LIMITS (°C)	15 m	30 m
0.25	0.10	-60 to 400	RTK-13950	RTK-13951
	0.25	-60 to 400	—	RTK-13952
0.32	0.10	-60 to 400	RTK-13953	RTK-13954
	0.25	-60 to 400	—	RTK-13955

Restek Rxi®-5HT Columns

- 40% longer lifetime for specially designed fused silica tubing
- Columns processed for high-temperature applications, such as analyzing mineral oil



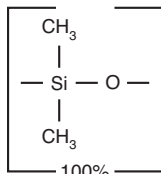
(low-polarity phase; diphenyl dimethyl polysiloxane)

Similar Phases: DB-5ht, VF-5ht, ZB-5HTinferno

ID (mm)	FILM (µm)	TEMP LIMITS (°C)	15 m	30 m
0.25	0.10	-60 to 400	RTK-13905	RTK-13908
	0.25	-60 to 400	—	RTK-13923
0.32	0.10	-60 to 400	RTK-13906	RTK-13909
	0.25	-60 to 400	—	RTK-13924
0.53	0.15	-60 to 380/400	—	RTK-13910

Restek Rtx[®]-1 Columns

- ➔ General-purpose columns for solvent impurities, PCB congeners (ie: Aroclor mixes), simulated distillation, arson accelerants, gases, natural gas odorants, sulfur compounds, essential oils, hydrocarbons, semivolatiles, pesticides, oxygenates
- ➔ Long lifetime and very low bleed at high operating temperatures
- ➔ Temperature range: -60 °C to 350 °C
- ➔ Equivalent to USP G1, G2, G38 phases



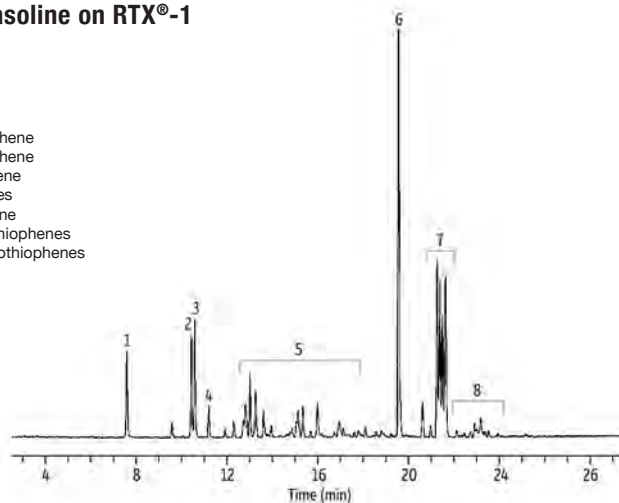
(nonpolar phase; Crossbond[®] dimethyl polysiloxane)

Similar Phases: HP-1, DB-1, CP-Sil 5 CB, ZB-1

ID (mm)	FILM (µm)	TEMP LIMITS (°C)	Length			
			10 m	20 m	40 m	
0.18	0.20	-60 to 330/350	RTK-40101	RTK-40102	RTK-40103	
	0.40	-60 to 330/340	RTK-40110	RTK-40111	RTK-40112	
ID (mm)	FILM (µm)	TEMP LIMITS (°C)	Length			
			15 m	30 m	60 m	
0.25	0.10	-60 to 330/350	RTK-10105	RTK-10108	RTK-10111	
	0.25	-60 to 330/350	RTK-10120	RTK-10123	RTK-10126	
	0.50	-60 to 330/350	RTK-10135	RTK-10138	RTK-10141	
	1.00	-60 to 320/340	RTK-10150	RTK-10153	RTK-10156	
0.32	0.10	-60 to 330/350	RTK-10106	RTK-10109	RTK-10112	
	0.25	-60 to 330/350	RTK-10121	RTK-10124	RTK-10127	
	0.50	-60 to 330/350	RTK-10136	RTK-10139	RTK-10142	
	1.00	-60 to 320/340	RTK-10151	RTK-10154	RTK-10157	
	1.50	-60 to 310/330	RTK-10166	RTK-10169	RTK-10172	
	3.00	-60 to 280/300	RTK-10181	RTK-10184	RTK-10187	
	4.00	-60 to 280/300	—	RTK-10198	—	
	5.00	-60 to 260/280	RTK-10176	RTK-10178	RTK-10180	
	0.53	0.10	-60 to 320/340	RTK-10107	RTK-10110	—
		0.25	-60 to 320/340	RTK-10122	RTK-10125	RTK-10128
0.50		-60 to 310/330	RTK-10137	RTK-10140	RTK-10143	
1.00		-60 to 310/330	RTK-10152	RTK-10155	RTK-10158	
1.50		-60 to 310/330	RTK-10167	RTK-10170	RTK-10173	
3.00		-60 to 270/290	RTK-10182	RTK-10185	RTK-10188	
5.00		-60 to 270/290	RTK-10177	RTK-10179	RTK-10183	
7.00		-60 to 240/260	RTK-10191	RTK-10192	RTK-10193	

Sulfur in Gasoline on RTX[®]-1

1. Thiophene
2. 2-Methylthiophene
3. 3-Methylthiophene
4. 2-Ethylthiophene
5. Alkylthiophenes
6. Benzothiophene
7. Methylbenzothiophenes
8. Dimethylbenzothiophenes



Column: Rtx[®]-1, 30 m, 0.32 mm ID, 4.0 µm 10198

Sample: Gasoline containing 330 ppm total sulfur

Inj. Volume: 1 µL split (split ratio 10:1)

Inj. Temp: 275 °C

Oven Temp: 40 °C (hold 3 min) to 275 °C at 10 °C/min (hold 5 min)

Carrier Gas: He, constant flow

Flow Rate: 2.5 mL/min

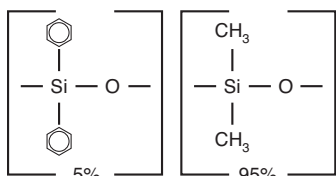
Linear Velocity: 70 cm/sec

Detector: SCD @ 275 °C

Restek Rtx[®]-5 Columns

- General-purpose columns for drugs, solvent impurities, pesticides, hydrocarbons, PCB congeners (ie: Aroclor mixes), essential oils, semivolatiles
- Equivalent to USP G27 and G36 phases.

The diphenyl dimethyl polysiloxane stationary phase is the most popular GC stationary phase and is used in a wide variety of applications. All residual catalysts and low molecular weight fragments are removed from the Rtx[®]-5 polymer, providing a tight monomodal distribution and extremely low bleed.



(low-polarity phase; Crossbond[®] diphenyl dimethyl polysiloxane)

■ Six columns for the price of five!

30 m	6/pk
0.25 mm ID, 0.25 μm	RTK-10223-600
0.25 mm ID, 0.50 μm	RTK-10238-600
0.32 mm ID, 1.00 μm	RTK-10254-600
0.53 mm ID, 1.50 μm	RTK-10270-600

Other phases and configuration available on request.

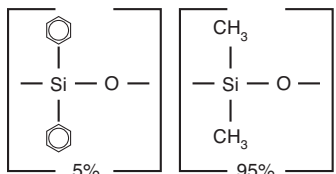
Similar Phases: Hp-5, DB-5, CP-Sil 8 CB, ZB-5

ID (mm)	FILM (μm)	TEMP LIMITS (°C)	Length		
			10 m	20 m	40 m
0.18	0.20	-60 to 325/340	RTK-40201	RTK-40202	RTK-40203
	0.40	-60 to 325/340	RTK-40210	RTK-40211	RTK-40212
ID (mm)	FILM (μm)	TEMP LIMITS (°C)	Length		
			15 m	30 m	60 m
0.25	0.10	-60 to 330/350	RTK-10205	RTK-10208	RTK-10211
	0.25	-60 to 330/350	RTK-10220	RTK-10223	RTK-10226
	0.50	-60 to 330/350	RTK-10235	RTK-10238	RTK-10241
	1.00	-60 to 325/340	RTK-10250	RTK-10253	RTK-10256
0.32	0.10	-60 to 330/350	RTK-10206	RTK-10209	—
	0.25	-60 to 330/350	RTK-10221	RTK-10224	RTK-10227
	0.50	-60 to 330/350	RTK-10236	RTK-10239	RTK-10242
	1.00	-60 to 325/340	RTK-10251	RTK-10254	RTK-10257
	1.50	-60 to 310/330	RTK-10266	RTK-10269	RTK-10272
	3.00	-60 to 280/300	RTK-10281	RTK-10284	RTK-10287
0.53	0.10	-60 to 320/340	RTK-10207	RTK-10210	—
	0.25	-60 to 320/340	RTK-10222	RTK-10225	RTK-10228
	0.50	-60 to 320/330	RTK-10237	RTK-10240	RTK-10243
	1.00	-60 to 320/330	RTK-10252	RTK-10255	RTK-10258
	1.50	-60 to 310/330	RTK-10267	RTK-10270	RTK-10273
	3.00	-60 to 270/290	RTK-10282	RTK-10285	RTK-10288
5.00	-60 to 270/290	RTK-10277	RTK-10279	RTK-10283	

Restek Rtx[®]-5MS—Low Bleed GC-MS Columns

- General purpose columns for drugs, solvent impurities, pesticides, hydrocarbons, PCB congeners (ie: Aroclor mixes), essential oils, semivolatiles
- Column specifically tested for low-bleed performance
- Equivalent to USP G27 and G36 phases

Note: The DB-5MS is a silarylene-based polymer equivalent to the Rxi-5Sil MS.



(low-polarity phase; Crossbond[®] diphenyl dimethyl polysiloxane)

Similar Phases: DB-5, HP-5, HP-5MS, Ultra-2, SPB-5, CP-Sil 8 CB, ZB-5

ID (mm)	FILM (μm)	TEMP LIMITS (°C)	Length		
			15 m	30 m	60 m
0.25	0.10	-60 to 330/350	RTK-12605	RTK-12608	RTK-12611
	0.25	-60 to 330/350	RTK-12620	—	RTK-12626
	0.50	-60 to 330/350	RTK-12635	RTK-12638	RTK-12641
	1.00	-60 to 325/350	RTK-12650	RTK-12653	—
0.32	0.10	-60 to 330/350	RTK-12606	RTK-12609	—
	0.25	-60 to 330/350	RTK-12621	RTK-12624	RTK-12627
	0.50	-60 to 330/350	—	RTK-12639	RTK-12642
0.53	1.00	-60 to 325/350	—	RTK-12654	—
	0.50	-60 to 320/340	RTK-12637	RTK-12640	—
	1.00	-60 to 320/340	RTK-12652	RTK-12655	—
1.50	-60 to 310/330	RTK-12667	RTK-12670	—	

Restek Rt[®]-2560 Column

- ➔ High polar phase: biscyanopropyl polysiloxane—not bonded
- ➔ Application-specific column for *cis/trans* FAMES
- ➔ Because the Rt[®]-2560 stationary phase is not bonded, it should not be solvent rinsed

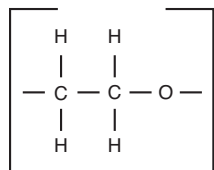
Similar Phases: HP-88, CP-Sil 88, SP-2560

ID (mm)	FILM (μm)	TEMP LIMITS (°C)	100 m
0.25	0.20	20 to 250	RTK-13199

Restek Rtx[®]-Wax Columns

- ➔ Best polyethylene glycol (PEG) phase for alkenols, glycols, and aldehydes
- ➔ Equivalent to USP G14, G15, G16, G20, G39 phases

Rtx[®]-Wax columns are the most inert and efficient PEG columns currently available. The extended operating temperature range allows analysis of compounds having a wide volatility range and ensures low bleed at temperatures as high as 250 °C. Selectivity is comparable to other Carbowax[®] columns for compounds of intermediate to high polarity.



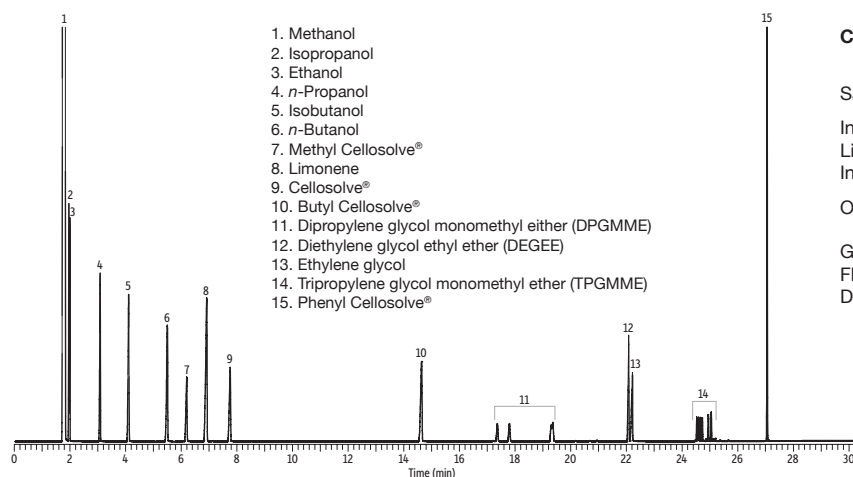
(polar phase; Crossbond[®] polyethylene glycol)

Similar Phases: DB-Wax, CP-Wax 52 CB, ZB-Wax

ID (mm)	FILM (μm)	TEMP LIMITS* (°C)	15 m	30 m	60 m
0.25	0.25	20 to 250	RTK-12420	RTK-12423	RTK-12426
	0.50	20 to 250	RTK-12435	RTK-12438	RTK-12441
0.32	0.25	20 to 250	—	RTK-12424	RTK-12427
	0.50	20 to 250	RTK-12436	RTK-12439	RTK-12442
	1.00	20 to 240/250	RTK-12451	RTK-12454	RTK-12457
0.53	0.25	20 to 250	—	RTK-12425	—
	0.50	20 to 250	—	RTK-12440	RTK-12443
	1.00	20 to 240/250	RTK-12452	RTK-12455	RTK-12458

*Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

Cleaning Solvents on RTX[®]-Wax



Column: Rtx[®]-Wax, 30 m, 0.32 mm ID, 0.25 μm 12424

Sample: 1% each solvent in methanol

Inj. Volume: 1 μL split (split ratio 100:1)

Liner: Splitless (4 mm ID)

Inj. Temp: 250 °C

Oven Temp: 35 °C (hold 4 min) to 85 °C at 3 °C/min

to 200 °C at 15 °C/min (hold 2 min) Carrier

Gas: H₂, constant flow

Flow Rate: 3 mL/min

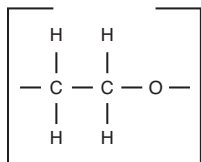
Detector: FID @ 250 °C

Restek Stabilwax® Columns

- ➔ Rugged enough to withstand repeated water injections
- ➔ Low-bleed PEG column ensures long column lifetimes
- ➔ Temperature range: 40 to 260 °C
- ➔ Equivalent to USP G14, G15, G16, G20, and G39 phases

Restek's polar-deactivated surface tightly binds the Carbowax® polymer and increases thermal stability, relative to competitive columns. Because of the increased stability produced by the bonding process, Stabilwax® columns exhibit long column lifetimes, even when programming repeatedly up to 260 °C. The bonding mechanism of the column also produces polar compound retention times that do not shift, as is often observed on other wax-type columns.

Typical applications include: FAMES, flavor compounds, essential oils, solvents, aromatics (including xylene isomers), acrolein/acrylonitrile (EPA603), and oxygenated compounds. Stabilwax® columns can also be used for purity testing of chemicals and analyzing impurities in water matrices and alcoholic beverages.



(polar phase; Crossbond®polyethylene glycol)

Similar Phases: HP-INNOWax, CP-Wax 52 CB, VF-WAX MS, ZB-WAXplus

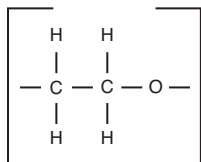
ID (mm)	FILM (µm)	TEMP LIMITS (°C)	10 m	20 m	60 m
0.15	0.15	40 to 250/260	RTK-43830	RTK-43831	—
0.18	0.18	40 to 250	—	RTK-40602	—
ID (mm)	FILM (µm)	TEMP LIMITS*	15 m	30 m	60 m
0.25	0.10	40 to 250/260	RTK-10605	RTK-10608	RTK-10611
	0.25	40 to 250/260	RTK-10620	RTK-10623	RTK-10626
	0.50	40 to 250/260	RTK-10635	RTK-10638	RTK-10641
0.32	0.25	40 to 250/260	RTK-10621	RTK-10624	RTK-10627
	0.50	40 to 250/260	RTK-10636	RTK-10639	RTK-10642
	1.00	40 to 240/250	RTK-10651	RTK-10654	RTK-10657
0.53	0.25	40 to 250/260	RTK-10622	RTK-10624	RTK-10628
	0.50	40 to 250/260	RTK-10637	RTK-10640	RTK-10643
	1.00	40 to 240/250	RTK-10652	RTK-10655	RTK-10658
	1.50	40 to 230/240	RTK-10666	RTK-10669	RTK-10672
2.00	40 to 220/230	RTK-10667	RTK-10670	—	

*Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

Restek Stabilwax®-MS Columns

- ➔ Low bleed and rugged enough to withstand repeated temperature cycles without retention time shifting
- ➔ Ideal for food, flavor, fragrance, and industrial chemical and solvent analysis
- ➔ Temperature range: 40 to 250/260 °C
- ➔ Equivalent to USP G14, G15, G16, G20, and G39 phases

New Stabilwax®-MS columns ensure reproducible retention times from run to run, even with temperature cycling. When methods require trace analysis, this highly polar, low-bleed stationary phase produces excellent signal-to-noise levels. Ideal for food and flavor analysis (ie: essential oils), fragrance and allergen analysis, as well as industrial solvent and chemical analysis.



High-polarity, stable polyethylene glycol (PEG) stationary phase

ID (mm)	FILM (µm)	30 m
0.25	0.25	RTK-10673
0.32	0.25	RTK-10674

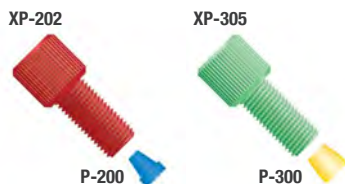
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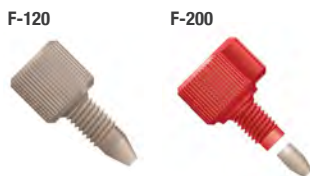


Featured Products

220 Flangeless Fittings for 1/16" & 1/8" OD Tubing



224 Upchurch Scientific® Fingertight Fittings



229 EXP®2 Fittings for Hand-Tight UHPLC Connections



253 PEEK Tubing



PEEK tubing has a very smooth internal surface, which causes less turbulence than the similarly sized metal tubing.

255 Tubing Cutters



262 Chrom Tech Solvent Waste Container System Kit



268 Inlet Solvent Filters



270 IDEX Rheodyne Valves & Accessories



289 Precolumn Filters

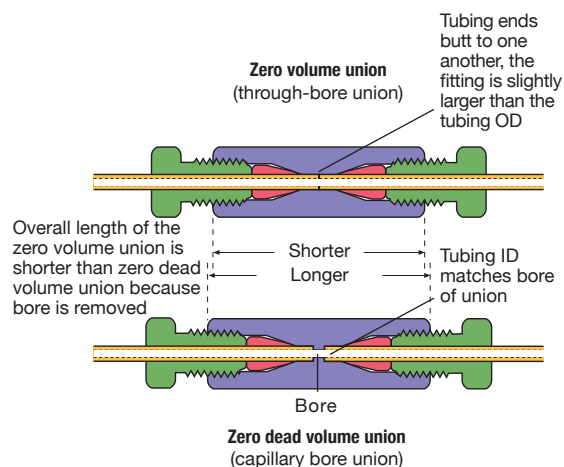


Notes from the Support Desk

Zero Volume vs. Zero Dead Volume

A true zero volume fittings is one in which no part of the fitting actually becomes a part of the flow path. The only fittings which fit this description are through-bore unions, which allow tubing to butt end-to-end. Even these are only zero volume if the tube ends are perfectly square.

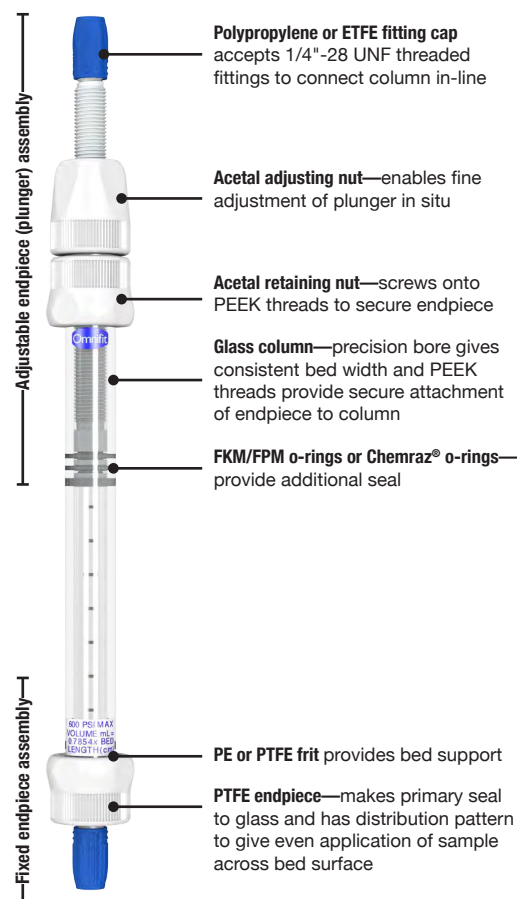
All other fittings are designed with zero dead volume: that is, there is no volume introduced by the fitting which is not cleanly swept.



Omnifit Empty Glass Columns

OMNIFIT EMPTY GLASS COLUMNS SPECIFICATIONS

	EZ	EZ SOLVENTPLUS™
OPERATING PARAMETERS		
Operating temp:	4 – 40 °C	4 – 40 °C
pH stability:	1 – 14	1 – 14
Chemical stability:	Resistant to aqueous solutions and most solvents used in liquid chromatography. Not resistant to acetone, ketones, chlorinated hydrocarbons, aliphatic ester, phenol, > 10% NaOH, > 10% HCl, > 5% acetic acid, or strong mineral acid.	Resistant to aqueous solutions and most solvents use in standard and reverse phase chromatography including toluene, DMSO, pyridine, formamide, dimethyl formamide, ethylene dichloride, and chloroform.
MATERIALS		
Glass column:	Borosilicate glass	Borosilicate glass
Endpiece & plunger:	PTFE	PTFE
Threaded ends:	PEEK™	PEEK™
Frit (bed support):	PE	PTFE
O-ring:	FKM/FPM	Chemraz®
Adjusting nut:	Acetal	Acetal
Retaining nut:	Acetal	Acetal
Connection cap:	Glass-filled PP	ETFE
Fitting nuts:	Glass-filled PP	ETFE
OPERATING PRESSURES		
5.0:	1200 PSI (80 bar)	1200 PSI (80 bar)
6.6:	900 PSI (60 bar)	900 PSI (60 bar)
10:	600 PSI (40 bar)	600 PSI (40 bar)
15:	300 PSI (20 bar)	300 PSI (20 bar)
25:	150 PSI (10 bar)	150 PSI (10 bar)
35:	150 PSI (10 bar)	150 PSI (10 bar)
50:	100 PSI (6.7 bar)	100 PSI (6.7 bar)



REPLACEMENT PARTS FOR OMNIFIT EMPTY GLASS COLUMNS

DESCRIPTION	FITS 5 ID	FITS 6.6 ID	FITS 10 ID	FITS 15 ID	FITS 25 ID	FITS 35 ID	FITS 50 ID
REPLACEMENT ENDPieces FOR EZ COLUMN, FITTED WITH A PAIR OF FKM/FPM O-RINGS AND 25 µm PE FRITS							
Fixed Endpiece	EZ-05F	EZ-06F	EZ-10F	EZ-15F	EZ-25F	EZ-35F	EZ-50F
Adjustable Endpiece	EZ-05A	EZ-06A	EZ-10A	EZ-15A	EZ-25A	EZ-35A	EZ-50A
REPLACEMENT ENDPieces FOR EZ SOLVENT PLUS™ COLUMN, FITTED WITH A SINGLE CHEMRAZ® O-RING AND 30 µm PTFE FRITS							
Fixed Endpiece	—	EZS-06F	EZS-10F	EZS-15F	EZS-25F	EZS-35F	EZS-50F
Adjustable Endpiece	—	EZS-06A	EZS-10A	EZS-15A	EZS-25A	EZS-35A	EZS-50A
REPLACEMENT FRITS, 20/PK							
PE, 25 µm	FR-0525PE	FR-0625PE	FR-1025PE	FR-1525PE	FR-2525PE	FR-3525PE	FR-5025PE
PTFE, 5 µm	FR-0505	FR-0605	FR-1005	FR-1505	FR-2505	FR-3505	FR-5005
PTFE, 10 µm	FR-0510	FR-0610	FR-1010	FR-1510	FR-2510	FR-3510	FR-5010
PTFE, 20 µm	FR-0520	FR-0620	FR-1020	FR-1520	FR-2520	FR-3520	FR-5020
PTFE, 30 µm	FR-0530	FR-0630	FR-1030	FR-1530	FR-2530	FR-3530	FR-5030
PTFE, 50 µm	FR-0550	FR-0650	FR-1050	FR-1550	FR-2550	FR-3550	FR-5050
REPLACEMENT O-RING							
FKM/FPM O-Ring	—	OR-06V	OR-10V	OR-15V	OR-25V	OR-35V	OR-50V
Chemraz® O-Ring	—	OR-06C	OR-10C	OR-15C	OR-25C	OR-35C	OR-50C

ASSEMBLED GLASS COLUMNS						
ID (mm)	LENGTH (mm)	EZ COLUMN ASSEMBLY		EZ COLUMN SOLVENT PLUS™ ASSEMBLY		REPLACEMENT GLASS FOR SOLVENTPLUS™
		2 FIXED ENDPieces	1 FIXED & 1 ADJUSTABLE ENDPiece	2 FIXED ENDPieces	1 FIXED & 1 ADJUSTABLE ENDPiece	GLASS ONLY
5	50	EZ-05050FC	EZ-05050AC	—	—	EZR-05050
5	100	EZ-05100FC	EZ-05100AC	—	—	EZR-05100
5	150	EZ-05150FC	EZ-05150AC	—	—	EZR-05150
5	250	EZ-05250FC	EZ-05250AC	—	—	EZR-05250
5	330	EZ-05330FC	EZ-05330AC	—	—	EZR-05330
5	400	EZ-05400FC	EZ-05400AC	—	—	EZR-05400
6.6	50	EZ-06050FC	EZ-06050AC	EZS-06050FC	EZS-06050AC	EZR-06050
6.6	100	EZ-06100FC	EZ-06100AC	EZS-06100FC	EZS-06100AC	EZR-06100
6.6	150	EZ-06150FC	EZ-06150AC	EZS-06150FC	EZS-06150AC	EZR-06150
6.6	250	EZ-06250FC	EZ-06250AC	EZS-06250FC	EZS-06250AC	EZR-06250
6.6	330	EZ-06330FC	EZ-06330AC	EZS-06330FC	EZS-06330AC	EZR-06330
6.6	400	EZ-06400FC	EZ-06400AC	EZS-06400FC	EZS-06400AC	EZR-06400
10	100	EZ-10100FC	EZ-10100AC	EZS-10100FC	EZS-10100AC	EZR-10100
10	150	EZ-10150FC	EZ-10150AC	EZS-10150FC	EZS-10150AC	EZR-10150
10	250	EZ-10250FC	EZ-10250AC	EZS-10250FC	EZS-10250AC	EZR-10250
10	330	EZ-10330FC	EZ-10330AC	EZS-10330FC	EZS-10330AC	EZR-10330
10	400	EZ-10400FC	EZ-10400AC	EZS-10400FC	EZS-10400AC	EZR-10400
10	500	EZ-10500FC	EZ-10500AC	EZS-10500FC	EZS-10500AC	EZR-10500
15	100	EZ-15100FC	EZ-15100AC	EZS-15100FC	EZS-15100AC	EZR-15100
15	150	EZ-15150FC	EZ-15150AC	EZS-15150FC	EZS-15150AC	EZR-15150
15	250	EZ-15250FC	EZ-15250AC	EZS-15250FC	EZS-15250AC	EZR-15250
15	330	EZ-15330FC	EZ-15330AC	EZS-15330FC	EZS-15330AC	EZR-15330
15	400	EZ-15400FC	EZ-15400AC	EZS-15400FC	EZS-15400AC	EZR-15400
15	500	EZ-15500FC	EZ-15500AC	EZS-15500FC	EZS-15500AC	EZR-15500
25	100	EZ-25100FC	EZ-25100AC	EZS-25100FC	EZS-25100AC	EZR-25100
25	150	EZ-25150FC	EZ-25150AC	EZS-25150FC	EZS-25150AC	EZR-25150
25	250	EZ-25250FC	EZ-25250AC	EZS-25250FC	EZS-25250AC	EZR-25250
25	330	EZ-25330FC	EZ-25330AC	EZS-25330FC	EZS-25330AC	EZR-25330
25	400	EZ-25400FC	EZ-25400AC	EZS-25400FC	EZS-25400AC	EZR-25400
25	500	EZ-25500FC	EZ-25500AC	EZS-25500FC	EZS-25500AC	EZR-25500
35	150	EZ-35150FC	EZ-35150AC	EZS-35150FC	EZS-35150AC	EZR-35150
35	250	EZ-35250FC	EZ-35250AC	EZS-35250FC	EZS-35250AC	EZR-35250
35	330	EZ-35330FC	EZ-35330AC	EZS-35330FC	EZS-35330AC	EZR-35330
35	400	EZ-35400FC	EZ-35400AC	EZS-35400FC	EZS-35400AC	EZR-35400
50	250	EZ-50250FC	EZ-50250AC	EZS-50250FC	EZS-50250AC	EZR-50250
50	330	EZ-50330FC	EZ-50330AC	EZS-50330FC	EZS-50330AC	EZR-50330
50	400	EZ-50400FC	EZ-50400AC	EZS-50400FC	EZS-50400AC	EZR-50400
50	500	EZ-50500FC	EZ-50500AC	EZS-50500FC	EZS-50500AC	EZR-50500

TECH TIP

We recommend one fixed endpiece as a bed support and one adjustable endpiece (plunger) to adjust the bed height (-AF). This gives the user fine control over the movement of the endpiece, minimizing the risk of disturbance to the packed bed and giving 80 mm of height adjustment. Two fixed endpieces are a cost effective option when column length adjustment is not necessary.

COLUMN ASSEMBLY INCLUDES:

- ➔ A ready-assembled column configuration comprising a glass tube with the specified end fittings, pre-assembled.
- ➔ Fittings kit and tubing
- ➔ Frit kit: 10 µm PE, 10 µm PTFE, 30 µm PTFE

SS Empty Column Tubes

- ➔ Tight internal bore specifications
- ➔ 316 stainless steel

Chrom Tech now offers empty stainless steel column tubes, listed below are the most popular dimensions. For a dimension that is not listed below, please call for part number and pricing.

STAINLESS STEEL EMPTY COLUMN TUBES

PART NO	ID (mm)	OD	LENGTH (cm)
SST-4605	4.6	1/4"	5
SST-4610	4.6	1/4"	10
SST-4615	4.6	1/4"	15
SST-4625	4.6	1/4"	25
SST-4005	4.0	1/4"	5
SST-4010	4.0	1/4"	10
SST-4015	4.0	1/4"	15
SST-4025	4.0	1/4"	25
SST-2105	2.1	1/4"	5
SST-2110	2.1	1/4"	10
SST-2115	2.1	1/4"	15
SST-2125	2.1	1/4"	25
SST-10005	10	1/2"	5
SST-10010	10	1/2"	10
SST-10015	10	1/2"	15
SST-10025	10	1/2"	25
SST-10050	10	1/2"	50

EXTERNAL COLUMN ENDFITTING WITH FRIT FOR 1/16" OD TUBING

PART NO	DESCRIPTION	COLUMN TUBE OD
ECEF414.6F	Endfitting for 4.6 mm ID	1/4"
ECEF414.0F	Endfitting for 4.0 mm ID	1/4"
ECEF412.1F	Endfitting for 2.1 mm ID	1/4"
ECEF8110.0F	Endfitting for 10 mm ID	1/2"

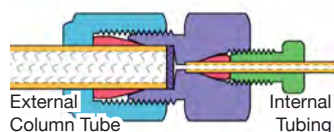
REPLACEMENT FRITS

2FR4	Replacement frit for 1/4" OD
2FR8	Replacement frit for 1/2" OD
2FR1K	Replacement frit for 1" OD

Note: Columns require two endfittings.



ECEF414.6F



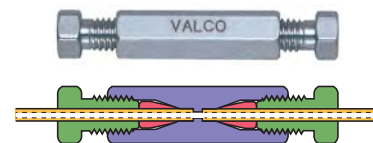
External Column Tube Internal Tubing

External Column End Fitting

Valco Stainless Steel Internal Unions

VALCO STANDARD INTERNAL UNIONS

TUBING OD	BORE	PART NO
1/32"	0.15 mm	ZU.5XC
	0.25 mm	ZU.5
	0.50 mm	ZU.5L
	1/32"	ZU.5T
1/16"	0.15 mm	ZU1XC
	0.25 mm	ZU1C
	0.50 mm	ZU1M
	0.75 mm	ZU1
	1.0 mm	ZU1L
1/8"	0.75 mm	ZU2
	2.0 mm	ZU2L
	1/8"	ZU2T
1/4"	0.75 mm	ZU4
	4.6 mm	ZU4L
	1/4"	ZU4T



Internal union—metal Standard bore version (ZU1)

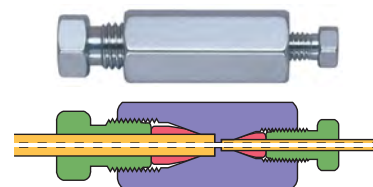
Ends of tubing seat squarely at bottoms of fitting details

Standard material is 300 series stainless. Also available in Hastelloy C, gold-plated stainless, and titanium.

Valco SS Internal Reducing Unions & Reducers

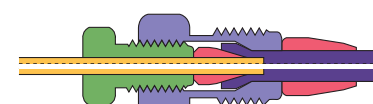
STANDARD INTERNAL REDUCING UNIONS

TUBING OD	BORE	PART NO
1/16" to 1/32"	0.15 mm	ZRU1.5XC
	0.25 mm	ZRU1.5
	0.50 mm	ZRU1.5L
	1/32"	ZRU1.5T
1/8" to 1/32"	0.25 mm	ZRU2.5
	0.50 mm	ZRU2.5L
	1/32"	ZRU2.5T
1/8" to 1/16"	0.25 mm	ZRU21C
	0.75 mm	ZRU21
	1/16"	ZRU21T
1/4" to 1/16"	0.25 mm	ZRU41C
	0.75 mm	ZRU41
	1/16"	ZRU41T
1/4" to 1/8"	1.0 mm	ZRU42
	2.0 mm	ZRU42L
	1/8"	ZRU42T



Internal reducing union—metal Standard bore (ZRU21)

These unions connect two sizes of tubing, using zero dead volume internal fittings on each end. In the bulkhead version, the bulkhead nut is on the side with smaller tubing. Standard material is 300 series stainless. Also available in Hastelloy C, gold-plated stainless, and titanium.



Valco's unique internal reducer (IZR21)

VALCO INTERNAL REDUCERS

TUBING OD	BORE	WITHOUT FRIT	WITH 2 μm FRIT
1/16" to 1/32"	0.25 mm	IZR1.5	IZR1.5F
	0.50 mm	IZR1.5L	IZR1.5LF
	1/32"	IZR1.5T	—
1/8" to 1/16"	0.50 mm	IZR21	IZR21F
	1.00 mm	IZR21L	IZR21LF
	1/16"	IZR21T	—
1/4" to 1/16"	1.00 mm	IZR41	IZR41F
1/4" to 1/8"	1.00 mm	IZR42	IZR42F



Valco Fittings

VALCO STAINLESS STEEL FITTINGS

PART NO	DESCRIPTION	LENGTH	QTY
ZN.5-10	1/32" Valco male nut	0.30"	10/pk
LZN.5-10	1/32" Valco male nut	0.45"	10/pk
ZF5S6-10	1/32" Valco ferrule		10/pk
ZP5	1/32" Valco Plug	0.30"	ea
ZN1-10	1/16" Valco male nut	0.43"	10/pk
MZN1-10	1/16" Valco male nut	0.50"	10/pk
LZN1-10	1/16" Valco male nut	0.75"	10/pk
ZF1-10	1/16" Valco ferrule		10/pk
ZP1	1/16" Valco Plug	0.43"	ea
ZN2-10	1/8" Valco male nut	0.57"	10/pk
LZN2-10	1/8" Valco male nut	0.82"	10/pk
ZP2	1/8" Valco Plug	0.57"	ea
ZF2-10	1/8" Valco ferrule		10/pk

VALCO STAINLESS STEEL EXTERNAL NUTS

PART NO	DESCRIPTION	QTY
EN1	1/16" Valco female nut	ea
EN2	1/8" Valco female nut	ea
EN4	1/4" Valco female nut	ea



Internal nuts



Plugs



External nuts

Valco Syringe Adapters

VALCO SYRINGE ADAPTERS

PART NO	DESCRIPTION
ZLA-1	Female luer adapter
VISF-1	Fill port for .750", 22g needles
VISF-2	Fill port for 2", 22g needles



ZLA-1



VISF-1



VISF-2

Valco Tees & Crosses

VALCO TEES & CROSSES

TUBING OD	BORE	TEES	CROSSES
1/32"	0.25	ZT.5	ZX.5
	0.50	ZT.5L	ZX.5L
1/16"	0.25	ZT1C	ZX1C
	0.50	ZT1M	ZX1M
	0.75	ZT1	ZX1
	1.00	ZT1L	ZX1L
1/8"	0.75	ZT2	ZX2
	2.00	ZT2L	ZX2L
1/4"	1.00	ZT4	ZX4
	4.60	ZT4L	ZX4L



Tees connect three lines. Crosses connect four lines. Standard material is 300 series stainless. Also available in Hastelloy C, gold plated stainless, and titanium.

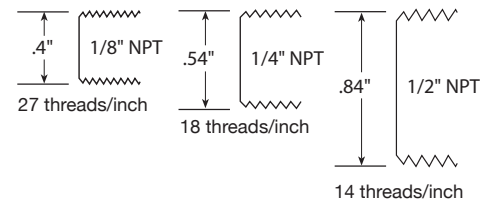
Valco Pipe Adapters

VALCO PIPE ADAPTERS

PART NO	DESCRIPTION
PZA21	1/8" NPT male pipe to 1/16" OD tube
PZA22	1/8" NPT male pipe to 1/8" OD tube
PZA41	1/4" NPT male pipe to 1/16" OD tube
PZA42	1/4" NPT male pipe to 1/8" OD tube (regulator to 1/8" tubing)

TECH TIP | Pipe Thread Sizes

NPT, National Pipe Thread, is a standard developed a long time ago by people without rulers. 1/8" NPT is nowhere close to 1/8". Measure the diameter of the fitting across the narrow end. You can also count the number of threads in a 1" section. Then look at the illustration below to determine the correct size needed.



Valco Sample Loops

Sample loops are required to use Valco valves for sample injection.

VALCO SAMPLE LOOPS

PART NO	VOLUME
VALCO C6W SAMPLE LOOPS	
SL10CW	10 µL
SL20CW	20 µL
SL50CW	50 µL
SL100CW	100 µL
SL250CW	250 µL
SL500CW	500 µL
SL1KCW	1 mL
SL2KCW	2 mL
SL5KCW	5 mL
SL10KCW	10 mL
UPCHURCH COMPATIBLE PEEK SAMPLE LOOPS	
1800	2 µL
1810	100 µL
1826	20 mL

*For Loops for other Valco valves, please specify valve part number.

Super Flangeless™ Fittings

- ➔ Highest pressure holding Flat-Bottom fitting system we offer
- ➔ Eliminates loosening of fittings due to tubing twist
- ➔ Excellent for tubing assemblies
- ➔ Holds tight even through vibration

Ferrules for M6x1, 1/4-28, 5/16-24

P-248 for 1/32" OD
P-250 for 1/16" OD
P-259 for 1/16" OD



P-260 for 1/16" OD



P-350 for 1/8" OD
P-359 for 1/8" OD



P-355 for 1.8 mm OD
P-366 for 2.5 mm OD
P-352 for 1/8" OD



P-360 for 1/8" OD



The lock ring allows tightening without twisting the tubing



Swaged lock ring holds the ferrule in place, preventing the nuts from sliding off in tubing assemblies

Biocompatible ferrules

6-40 and 6-32 Options (for 1/16" OD Tubing)



10-32 Options (for 1/16" OD Tubing)

One-Piece Super Flangeless Fittings

P-329 M6X1, for 1/8" OD
P-249 1/4-28, for 1/16" OD
P-349 1/4-28, for 1/8" OD



SUPER FLANGELESS FITTINGS

PART NO	DESCRIPTION	PORT	PRESSURE RATING	HEAD STYLE	MATERIAL	QTY
FERRULES FOR 1/32", 1/16", 1/8", 3/16", 1/8 mm, 2.0 mm, 2.5 mm						
M-250	Ferrule for 1/16" OD Tubing	10-32 Flat-Bottom	1,000 – 5,000 PSI	—	PEEK Natural/SST	ea
M-650	Ferrule for 1/16" OD Tubing	6-32 or 6-40 Flat-Bottom	750 – 3,750 PSI	—	PEEK Natural/SST	ea
P-248	Ferrule for 1/32" OD Tubing	10-32 Flat-Bottom	2,500 PSI	—	ETFE Green/SST	ea
P-250	Ferrule for 1/16" OD Tubing	1/4-28 or M6 Flat-Bottom	2,500 PSI	—	PEEK Natural/SST	ea
P-259	Ferrule for 1/16" OD Tubing	1/4-28 or M6 Flat-Bottom	1,350 PSI	—	ETFE Yellow/SST	ea
P-260	Ferrule for 1/16" OD Tubing	1/4-28 or M6 Flat-Bottom	1,850 PSI	—	PEEK Natural/SST	ea
P-350	Ferrule for 1/8" OD Tubing	1/4-28 Flat-Bottom	2,500 PSI	—	PEEK Natural/SST	ea
P-352	Ferrule for 1/16" OD Tubing	1/4-28 or M6 Flat-Bottom	2,500 PSI	—	PEEK Black/SST	ea
P-355	Ferrule for 1.8 mm OD Tubing	1/4-28 or M6 Flat-Bottom	2,500 PSI	—	PCTFE Green/SST	ea
P-357-2	Ferrule for 2.0 mm OD Tubing	M6 Flat-Bottom	5,000 PSI	—	PEEK Natural/SST	ea
P-359	Ferrule for 1/8" OD Tubing	1/4-28 Flat-Bottom	1,000 PSI	—	ETFE Yellow/SST	ea
P-360	Ferrule for 1/8" OD Tubing	1/4-28 Flat-Bottom	1,500 PSI	—	PEEK Natural/SST	ea
P-366	Ferrule for 2.5 mm OD Tubing	1/4-28 Flat-Bottom	1,000 PSI	—	PEEK Natural/SST	ea
P-140	Ferrule for 3/16" OD Tubing	5/16-24 Flat-Bottom	500 PSI	—	ETFE Green/SST	ea
6-40 AND 6-32 FITTINGS FOR 1/16" OD TUBING						
M-660	Nut for 1/16" OD Tubing	6-32 Flat-Bottom	750 – 3,750 PSI	Micro Headless	PEEK Natural	ea
M-644-03	Nut for 1/16" OD Tubing	6-40 Flat-Bottom	750 – 3,750 PSI	Micro Headless	PEEK Green	ea
10-32 FITTINGS FOR 1/16" OD TUBING						
M-652	Nut for 1/16" OD Tubing	10-32 Flat-Bottom	1,000 – 5,000 PSI	1/4" Hex	PEEK Green	ea
M-653	Nut for 1/16" OD Tubing	10-32 Flat-Bottom	1,000 – 5,000 PSI	Headless Knurl	PEEK Green	ea
M-655	Nut for 1/16" OD Tubing, Long	10-32 Flat-Bottom	1,000 – 5,000 PSI	1/4" Hex	PEEK Green	ea
ONE-PIECE SUPER FLANGELESS FOR 1/16" AND 1/8" OD TUBING						
P-229	Fitting for 1/16" OD Tubing	M6 Flat-Bottom	1,000 PSI	Standard Knurl	PEEK	ea
P-249	Fitting for 1/16" OD Tubing	1/4-28 Flat-Bottom	1,000 PSI	Standard Knurl	PEEK	ea
P-329	Fitting for 1/8" OD Tubing	M6 Flat-Bottom	1,000 PSI	Standard Knurl	PEEK	ea
P-349	Fitting for 1/8" OD Tubing	1/4-28 Flat-Bottom	1,000 PSI	Standard Knurl	PEEK	ea

M6x1, 1/4-28, 5/16-24 Options for 1/32" – 3/16" OD Tubing

F-356 (1/4-28, ≤ 1/16" OD)
F-364 (1/4-28, > 1/16" OD)



P-217 (M6X1, ≤ 1/16" OD)
P-317 (M6X1, > 1/16" OD)
P-246, P-252, P-255, P-251
 (1/4-28, ≤ 1/16" OD)
P-331, P-332, P-381
 (1/4-28, > 1/16" OD)



LT-105 (1/4-28 ≤ 1/16" OD)
C-235 (1/4-28 > 1/16" OD)



LT-210 (1/4-28, > 1/16" OD)



P-213 (M6X1, ≤ 1/16" OD)
P-337 (M6X1, > 1/16" OD)
P-232 (1/4-28, ≤ 1/16" OD)
P-336 (1/4-28, > 1/16" OD)



P-420 (1/4-28 ≤ 1/16" OD)
F-156 (1/4-28 > 1/16" OD)



P-287 (1/4-28 ≤ 1/16" OD)
P-387 (1/4-28 > 1/16" OD)



P-141 (5/16-24, ≤ 1/16" OD)
P-131 (5/16-24, > 1/16" OD – ≤ 1/8" OD)
P-137 (5/16-24, 3/16" OD)



P-219 (M6X1, ≤ 1/16" OD)
P-319 (M6X1, > 1/16" OD)
LT-115 (1/4-28, ≤ 1/16" OD)
LT-215 (1/4-28, > 1/16" OD)



SUPER FLANGELESS FITTINGS

PART NO	DESCRIPTION	PORT	PRESSURE RATING	HEAD STYLE	MATERIAL	QTY
M6X1 FITTINGS FOR 1/16" AND 1/32" OD TUBING						
P-213	Nut for 1/16" or 1/32" OD Tubing, Short	M6 Flat-Bottom	*	Headless Knurl	PEEK Black	ea
P-217	Nut for 1/16" or 1/32" OD Tubing	M6 Flat-Bottom	*	Standard Knurl	PPS Black	ea
P-219	Nut for 1/16" or 1/32" OD Tubing, Short	M6 Flat-Bottom	*	Standard Knurl	PEEK Black	ea
M6X1 FITTINGS FOR 1.8 mm, 2.0 mm, 2.5 mm, 1/8" OD TUBING						
P-317	Nut for > 1/16" – ≤ 1/8" OD Tubing	M6 Flat-Bottom	*	Standard Knurl	PPS Black	ea
P-319	Nut for 1/8" OD Tubing, Short	M6 Flat-Bottom	*	Standard Knurl	PEEK Black	ea
P-337	Nut for > 1/16" – ≤ 1/8" OD Tubing, Short	M6 Flat-Bottom	*	Headless Knurl	PEEK Black	ea
P-357	Nut for 2.0 mm OD Tubing	M6 Flat-Bottom	*	Standard Knurl	PEEK Black, Natural SST	ea
1/4-28 FITTINGS FOR 1/16" AND 1/32" OD TUBING						
F-356	Nut for 1/16" or 1/32" OD Tubing, FlushNut	1/4-28 Flat-Bottom	*	FlushNut	SST	ea
LT-105	Nut for 1/16" or 1/32" OD Tubing, Short	1/4-28 Flat-Bottom	*	1/4" Hex	SST	ea
LT-115	Nut for 1/16" or 1/32" OD Tubing, Short	1/4-28 Flat-Bottom	*	Standard Knurl	PEEK Natural	ea
P-232	Nut for 1/16" or 1/32" OD Tubing, Short	1/4-28 Flat-Bottom	*	Headless Knurl	PEEK Natural	ea
P-246	Nut for 1/16" or 1/32" OD Tubing	1/4-28 Flat-Bottom	*	Standard Knurl	PFA Natural	ea
P-252	Nut for 1/16" or 1/32" OD Tubing	1/4-28 Flat-Bottom	*	Standard Knurl	Delrin® Gray	ea
P-255	Nut for 1/16" or 1/32" OD Tubing	1/4-28 Flat-Bottom	*	Standard Knurl	PEEK Natural	ea
P-281	Nut for 1/16" or 1/32" OD Tubing	1/4-28 Flat-Bottom	*	Standard Knurl	PPS Natural	ea
P-287	Nut for 1/16" or 1/32" OD Tubing	1/4-28 Flat-Bottom	*	Headless Knurl	PPS Natural	ea
P-420	Nut for 1/16" or 1/32" OD Tubing, Female	1/4-28 Flat-Bottom	*	Female Knurl	PEEK Natural	ea
1/4-28 FITTINGS FOR 1.8 mm, 2.5 mm, 1/8" OD TUBING						
C-235	Nut for 1/8" OD Tubing	1/4-28 Flat-Bottom	*	1/4" Hex	SST	ea
F-156	Nut for 1/8" OD Tubing	1/4-28 Flat-Bottom	*	Female Knurl	PEEK Black	ea
F-364	Nut for 1/8" OD Tubing	1/4-28 Flat-Bottom	*	FlushNut	SST	ea
LT-210	Nut for 1/8" OD Tubing	1/4-28 Flat-Bottom	*	Double Wings	PEEK Natural	ea
LT-215	Nut for 1/8" OD Tubing	1/4-28 Flat-Bottom	*	Standard Knurl	PEEK Natural	ea
P-331	Nut for 1/8" OD Tubing	1/4-28 Flat-Bottom	*	Standard Knurl	PEEK Natural	ea
P-332	Nut for 1/8" OD Tubing	1/4-28 Flat-Bottom	*	Standard Knurl	Delrin Black	ea
P-336	Nut for 1/8" OD Tubing	1/4-28 Flat-Bottom	*	Standard Knurl	PEEK Natural	ea
P-381	Nut for 1/8" OD Tubing	1/4-28 Flat-Bottom	*	Headless Knurl	PPS Natural	ea
P-387	Nut for 1/8" OD Tubing	1/4-28 Flat-Bottom	*	Female Knurl	PPS Natural	ea
5/16-24 FITTINGS FOR 1/16", 1/8", 3/16" OD TUBING						
P-131	Nut for 1/8" OD Tubing	5/16-24 Flat-Bottom	*	Standard Knurl	PEEK Natural	ea
P-137	Nut for 3/16" OD Tubing	5/16-24 Flat-Bottom	*	Standard Knurl	PEEK Black	ea
P-141	Nut for 1/16" OD Tubing	5/16-24 Flat-Bottom	*	Standard Knurl	PEEK Natural	ea

*Pressure rating of nut depends on the ferrule used.

Flangeless Fittings for 1/16" & 1/8" OD Tubing

- ➔ Wide variety of materials and geometries to fit most applications
- ➔ Fittings and ferrules packaged together for easy ordering convenience

Upchurch Scientific® Flangeless Fittings for 1/16" and 1/8" OD tubing feature a wide assortment of nut geometries and materials from which to choose.

The P-312 Lock Nut is for use with any 1/4-28 male Flangeless Fitting. Use this product in applications where vibrations can loosen fittings.



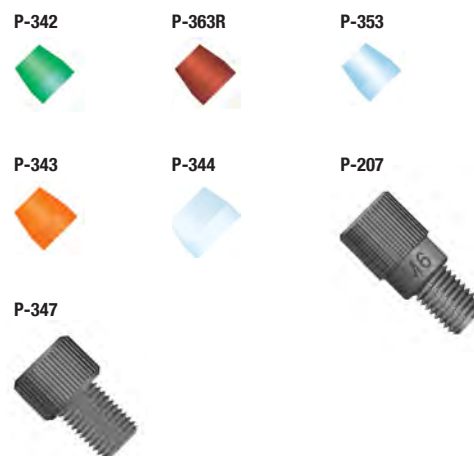
IDEX FLANGELESS FITTINGS

PART NO with ferrule	PART NO without ferrule	TUBING SIZE	PORT	PRESSURE RATING	HEAD STYLE	MATERIAL	QTY
FLANGELESS FITTINGS FOR 1/16" OD TUBING (PART NUMBER WITH FERRULE INCLUDES P-200 FERRULES)							
XF-358	F-358	1/16" OD Tubing	1/4-28 Flat-Bottom	2,000 PSI (138 bar)	FlushNut	SST/ETFE Blue	ea
XLT-111	LT-111	1/16" OD Tubing	10-32 Flat-Bottom	2,500 PSI (172 bar)	Standard Knurl	PEEK Natural/ETFE Natural	ea
XP-201	P-201	1/16" OD Tubing	1/4-28 Flat-Bottom	2,000 PSI (138 bar)	Standard Knurl	Delrin Black/ETFE Blue	ea
XP-202	P-202	1/16" OD Tubing	1/4-28 Flat-Bottom	2,000 PSI (138 bar)	Standard Knurl	Delrin Red/ETFE Blue	ea
XP-218	P-218	1/16" OD Tubing	1/4-28 Flat-Bottom	2,000 PSI (138 bar)	Standard Knurl	ETFE Natural/ETFE Blue	ea
XP-230	P-230	1/16" OD Tubing	1/4-28 Flat-Bottom	2,000 PSI (138 bar)	Standard Knurl	PEEK Natural/ETFE Blue	ea
XP-235X	P-235X	1/16" OD Tubing, Short	1/4-28 Flat-Bottom	2,000 PSI (138 bar)	Standard Knurl	PEEK Natural/ETFE Blue	10/pk
XP-245	P-245	1/16" OD Tubing	1/4-28 Flat-Bottom	2,000 PSI (138 bar)	Standard Knurl	PFA Natural/ETFE Blue	ea
XP-286	P-286	1/16" OD Tubing	1/4-28 Flat-Bottom	2,000 PSI (138 bar)	Headless Knurl	PPS Natural/ETFE Blue	ea
REPLACEMENT FERRULES							
P-200X		1/16" OD Tubing	1/4-28 Flat-Bottom	2,000 PSI (138 bar)	—	ETFE Blue	10/pk
P-200NX		1/16" OD Tubing	1/4-28 Flat-Bottom	2,000 PSI (138 bar)	—	ETFE Natural	10/pk
P-240		1/16" OD Tubing, Small Valve	1/4-28 or 10-32 Flat-Bottom	2,500 PSI (172 bar)	—	ETFE Natural	ea
FLANGELESS FITTINGS FOR 1/8" OD TUBING (PART NUMBER WITH FERRULE INCLUDES P-300 FERRULES)							
XF-368	F-368	1/8" OD Tubing	1/4-28 Flat-Bottom	500 PSI (34 bar)	FlushNut	SST/ETFE Yellow	ea
XP-301	P-301	1/8" OD Tubing	1/4-28 Flat-Bottom	500 PSI (34 bar)	Standard Knurl	Delrin Black/ETFE Yellow	ea
XP-302	P-302	1/8" OD Tubing	1/4-28 Flat-Bottom	500 PSI (34 bar)	Standard Knurl	Delrin Red/ETFE Yellow	ea
XP-305	P-305	1/8" OD Tubing	1/4-28 Flat-Bottom	500 PSI (34 bar)	Standard Knurl	Delrin Green/ETFE Yellow	ea
XP-308	P-308	1/8" OD Tubing	1/4-28 Flat-Bottom	500 PSI (34 bar)	Standard Knurl	Delrin Black/ETFE Yellow	ea
XP-315	P-315	1/8" OD Tubing	1/4-28 Flat-Bottom	500 PSI (34 bar)	Standard Knurl	ETFE Natural/ETFE Yellow	ea
XP-330	P-330	1/8" OD Tubing	1/4-28 Flat-Bottom	500 PSI (34 bar)	Standard Knurl	PEEK Natural/ETFE Yellow	ea
XP-335X	P-335X	1/8" OD Tubing	1/4-28 Flat-Bottom	500 PSI (34 bar)	Standard Knurl	PEEK Natural/ETFE Yellow	10/pk
REPLACEMENT FERRULES							
P-300X		1/8" OD Tubing	1/4-28 Flat-Bottom	500 PSI (34 bar)	—	ETFE Yellow	10/pk
P-300NX		1/8" OD Tubing	1/4-28 Flat-Bottom	500 PSI (34 bar)	—	ETFE Natural	10/pk
P-312		Lock Nut for Flangeless Nuts	1/4-28 Flat-Bottom	—	—	Delrin White	ea
PLUG							
P-309		N/A	1/4-28 Flat-Bottom	—	—	Delrin Black	ea

Metric Flangeless Fittings

- ➔ For 1/16", 1.8 mm, 2.0 mm, 2.5 mm, 3.0 mm, 4.0 mm or 1/8" OD Tubing
- ➔ Convenience of flangeless fittings for metric tubing sizes and M6 flat-bottom ports

Upchurch Scientific® Metric Flangeless Ferrules are designed to connect 1.8, 2.0, 2.5, 3.0, 4.0 mm OD tubing to flat-bottom ports when paired with the appropriate M6, 1/4-28, or 5/16-24 Flangeless Nuts. We also offer M6-threaded nuts to connect 1/16" or 1/8" OD tubing, plus a tubing sleeve to facilitate 1.0 mm OD tubing connections. Please refer to the "Metric Connections" chart on this page for information regarding which nuts and ferrules to use with your tubing.



TECH TIP | Metric Connections

Use this chart to determine the low pressure fittings needed to connect metric and English-sized tubing into the indicated ports.

Tubing Size	Port	Ferrules	Nuts
1.0 mm	M6 1/4-28	P-200 (w/F-252 sleeve, not included) P-200 (w/F-252 sleeve, not included)	P-207, P-207S, P-247 Any 1/4-28 nut compatible with 1/16" OD Tubing from pg 220
1.8 mm	M6 1/4-28	P-342 P-342	P-307, P-307S, P-347 Any nut compatible with 1/8" OD Tubing from pg 220
2.0 mm	M6 1/4-28	P-363R P-363R	P-307, P-307S, P-347 Any nut compatible with 1/8" OD Tubing from pg 220
2.5 mm	M6 1/4-28	P-353 P-353	P-307, P-307S, P-347 Any nut compatible with 1/8" OD Tubing from pg 220
3.0 mm	M6 1/4-28	P-343 P-343	P-307, P-307S, P-347 Any nut compatible with 1/8" OD Tubing from pg 220
4.0 mm	5/16-24	P-344	XP-132 from page 223

METRIC FLANGELESS FITTINGS

PART NO	DESCRIPTION	PORT	PRESSURE RATING	HEAD STYLE	MATERIAL	QTY
METRIC FLANGELESS NUTS						
P-207	Flangeless Nut for 1/16" OD Tubing	M6 Flat-Bottom	2,000 PSI (138 bar)	Standard Knurl	Delrin Black	ea
P-247	Flangeless Nut for 1/16" OD Tubing, Short	M6 Flat-Bottom	2,000 PSI (138 bar)	Standard Knurl	PEEK Black	ea
P-307	Flangeless Nut for 1.8 mm, 2.0 mm, 3.0 mm, 1/8" OD Tubing	M6 Flat-Bottom	500 PSI (34 bar)	Standard Knurl	Delrin Black	ea
P-307S	Flangeless Nut for 1.8 mm, 2.0 mm, 3.0 mm, 1/8" OD Tubing	M6 Flat-Bottom	500 PSI (34 bar)	Standard Knurl	Delrin Black	ea
P-347	Flangeless Nut for 1.8 mm, 2.0 mm, 3.0 mm, 1/8" OD Tubing	M6 Flat-Bottom	500 PSI (34 bar)	Standard Knurl	PEEK Black	ea
FLANGELESS FERRULES						
F-252	1/16" OD Tubing Sleeve for 1.0 mm ID Tubing	M6 or 1/4-28 Flat-Bottom	500 PSI (34 bar)	—	FEP Purple	ea
P-200X	Flangeless Ferrule for 1/16" OD Tubing	M6 or 1/4-28 Flat-Bottom	2,000 PSI (138 bar)	—	ETFE Blue	10/pk
P-300X	Flangeless Ferrule for 1/8" OD Tubing	M6 or 1/4-28 Flat-Bottom	500 PSI (34 bar)	—	ETFE Yellow	10/pk
P-342X	Flangeless Ferrule for 1.8 mm OD Tubing	M6 or 1/4-28 Flat-Bottom	500 PSI (34 bar)	—	ETFE Green	10/pk
P-343X	Flangeless Ferrule for 3.0 mm OD Tubing	M6 or 1/4-28 Flat-Bottom	500 PSI (34 bar)	—	ETFE Orange	10/pk
P-344X	Flangeless Ferrule for 4.0 mm OD Tubing	5/16-24	250 PSI (17 bar)	—	ETFE Natural	10/pk
P-353	Flangeless Ferrule for 2.5 mm OD Tubing	M6 or 1/4-28 Flat-Bottom	500 PSI (34 bar)	—	ETFE Natural	ea
P-363R	Flangeless Ferrule for 2.0 mm OD Tubing	M6 or 1/4-28 Flat-Bottom	500 PSI (34 bar)	—	ETFE Red	ea

*To order 1/4-28 threaded Flangeless Nuts separately from the Flangeless Ferrules, simply remove the preceding "X" from the appropriate part number.

Vaplock NPT Adapters for Hard Wall & Soft Wall Tubing

VAPLOCK NPT ADAPTERS FOR HARD WALL AND SOFT TUBING						
PART NO	TUBING	SIZE (NPT)	MATERIAL	COLOR	QTY	
HARDWALL TUBING ADAPTERS						
AC-150	1/16" OD	1/4"	Polypropylene, ETFE	Green	ea	
AC-151	1.8 – 2.0 mm OD	1/4"	Polypropylene, ETFE	Red	ea	
AC-152	2.2 mm OD	1/4"	Polypropylene, ETFE	Black	ea	
AC-153	2.5 mm OD	1/4"	Polypropylene, ETFE	Orange	ea	
AC-154	3.0 mm OD	1/4"	Polypropylene, ETFE	Yellow	ea	
AC-155	1/8" OD	1/4"	Polypropylene, ETFE	Blue	ea	
AC-108	4.0 mm OD	1/4"	PEEK, Polypropylene, ETFE	Brown	ea	
AC-109	3/16" OD	1/4"	Polypropylene, ETFE, Delrin	White	ea	
AC-113V	1/4" OD	1/4"	Polypropylene	Natural	5/pk	
AC-114V	5/16" OD	1/4"	Polypropylene	Natural	5/pk	
AC-115V	3/8" OD	1/4"	Polypropylene	Natural	5/pk	
AC-116V	1/2" OD	1/4"	Polypropylene	Natural	5/pk	
AC-204V	3/8" OD	1/2"	Polypropylene	Natural	5/pk	
AC-205V	1/2" OD	1/2"	Polypropylene	Natural	5/pk	
AC-206V	5/8" OD	1/2"	Polypropylene	Natural	5/pk	
AC-207V	3/4" OD	1/2"	Polypropylene	Natural	5/pk	
BARBED SOFTWALL TUBING ADAPTERS						
AB-111X	1/16" ID	1/4"	Polypropylene		10/pk	
AB-112X	1/8" ID	1/4"	Polypropylene		10/pk	
AB-118X	5/32" ID	1/4"	Polypropylene		10/pk	
AB-113X	3/16" ID	1/4"	Polypropylene		10/pk	
AB-114X	1/4" ID	1/4"	Polypropylene		10/pk	
AB-115X	5/16" ID	1/4"	Polypropylene		10/pk	
AB-116X	3/8" ID	1/4"	Polypropylene		10/pk	
AB-117X	1/2" ID	1/4"	Polypropylene		10/pk	
AB-204X	1/4" ID	1/2"	Polypropylene		10/pk	
AB-205X	3/8" ID	1/2"	Polypropylene		10/pk	
AB-206X	1/2" ID	1/2"	Polypropylene		10/pk	
AB-207X	5/8" ID	1/2"	Polypropylene		10/pk	
AB-208X	3/4" ID	1/2"	Polypropylene		10/pk	
SOFTWALL ADAPTER PLUGS FOR 1/4" AND 1/2" NPT PORTS						
PL-101X	Plug	1/4"	Polypropylene		10/pk	
PL-105	Plug	1/4"	PTFE		ea	
PL-102X	Plug	1/2"	Polypropylene		10/pk	
EXTERNAL MALE NPT ADAPTERS*						
PART NO	TUBING	THREADS	THREADS	COLOR	THRU-HOLE	INCLUDES
U-510	1/8"	PEEK 1/8" NPT	1/4-28 Flat Btm, Female	Red	0.062" (1.60 mm)	(1) XP-308
U-511	N/A	PEEK 1/8" NPT	1/4-28 Flat Btm, Male	Red	0.062" (1.60 mm)	N/A
U-512	1/8"	PEEK 1/8" NPT	M6 Female	Black	0.062" (1.60 mm)	(1) P-307 (1) P-300
U-514	3/16"	PEEK 1/8" NPT	5/16-24 Flat Btm, Female	Natural	0.125" (3.2 mm)	(1) XP-132
U-500	1/8"	PEEK 1/4" NPT	1/4-28 Flat Btm, Female	Red	0.062" (1.60 mm)	(1) XP-308
U-501	N/A	PEEK 1/4" NPT	1/4-28 Flat Btm, Male	Red	0.062" (1.60 mm)	N/A
U-502	1/8"	PEEK 1/4" NPT	M6 Female	Black	0.062" (1.60 mm)	(1) P-307 (1) P-300
U-503	1/8"	PEEK 1/4" NPT	5/16-24 Female	Natural	0.062" (1.60 mm)	(1) P-131 (1) P-360
U-504	3/16"	PEEK 1/4" NPT	5/16-24 Female	Natural	0.125" (3.2 mm)	(1) XP-132

AC-150



AC-155

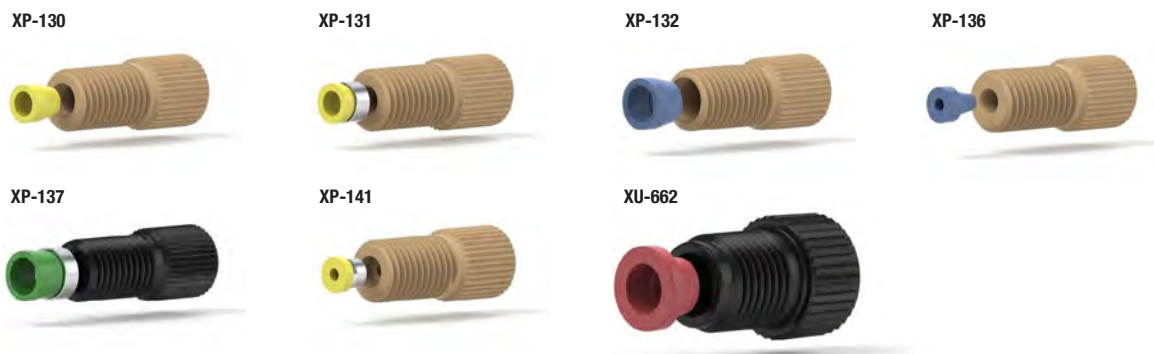


For secure fluid connections to a manifold, select a fitting based on your tubing outer diameter (OD) for hard wall tubing or inner diameter (ID) for soft wall tubing. Wrap NPT threads 3-4 times and wrench tighten for leak-resistant connections.



Large Bore Fittings

- ➔ 5/16-24 or 1/2-20 threads
- ➔ For use with 1/16", 1/8", 3/16", 1/4", 5/16", 3.0 mm, or 4.0 mm OD tubing



LARGE BORE FITTINGS						
PART NO	DESCRIPTION	PORT	PRESSURE RATING	HEAD STYLE	MATERIAL	QTY
XP-130	Flangeless Fitting for 1/8" OD Tubing	5/16-24 Flat-Bottom	500 PSI (34 bar)	Standard Knurl	PEEK Natural/ETFE Yellow	ea
XP-131	Super Flangeless Fitting for 1/8" OD Tubing	5/16-24 Flat-Bottom	1,000 PSI (69 bar)	Standard Knurl	PEEK Natural/ETFE Yellow/SST	ea
XP-132	Flangeless Fitting for 3/16" OD Tubing	5/16-24 Flat-Bottom	500 PSI (34 bar)	Standard Knurl	PEEK Natural/ETFE Blue	ea
XP-136	Flangeless Fitting for 1/16" OD Tubing	5/16-24 Flat-Bottom	2,000 PSI (138 bar)	Standard Knurl	PEEK Natural/ETFE Blue	ea
XP-137	Super Flangeless Fitting for 3/16" OD Tubing	5/16-24 Flat-Bottom	500 PSI (34 bar)	Standard Knurl	PEEK Black/ETFE Green/SST	ea
XP-141	Super Flangeless Fitting for 1/16" OD Tubing	5/16-24 Flat-Bottom	1,350 PSI (93 bar)	Standard Knurl	PEEK Natural/ETFE Yellow/SST	ea
XP-143X	Flangeless Fitting for 3.0 mm OD Tubing	5/16-24 Flat-Bottom	500 PSI (34 bar)	Standard Knurl	PEEK Natural/ETFE Orange	10/pk
XU-620	Flangeless Fitting for 1/4" OD Tubing	1/2-20 Coned	250 PSI (17 bar)	Large Knurl	PEEK Red/ETFE Natural	ea
XU-655	Flangeless Fitting for 1/4" OD Tubing	1/2-20 Flat-Bottom	250 PSI (17 bar)	Large Knurl	PEEK Black/ETFE Natural	ea
XU-662	Flangeless Fitting for 5/16" OD Tubing	1/2-20 Flat-Bottom	250 PSI (17 bar)	Large Knurl	PEEK Black/ETFE Natural	ea
REPLACEMENT FERRULES						
P-133	Flangeless Ferrule for 3/16" OD Tubing	5/16-24 Flat-Bottom	500 PSI (34 bar)	—	ETFE Blue	ea
P-133N	Flangeless Ferrule for 3/16" OD Tubing	5/16-24 Flat-Bottom	500 PSI (34 bar)	—	ETFE Natural	ea
P-140	Super Flangeless Ferrule for 3/16" OD Tubing	5/16-24 Flat-Bottom	500 PSI (34 bar)	—	ETFE Green	ea
U-650	Flangeless Ferrule for 1/4" OD Tubing	1/2-20 Flat-Bottom	250 PSI (17 bar)	—	ETFE Natural	ea
U-660	Flangeless Ferrule for 5/16" OD Tubing	1/2-20 Flat-Bottom	250 PSI (17 bar)	—	ETFE Natural	ea

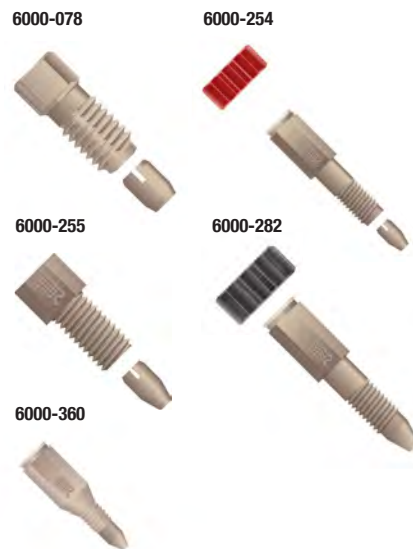
(The nuts can be ordered separately—simply remove the preceding "X" from the part number to reference the nut separate from the pre-packaged ferrules)

Rheodyne RheFlex® Fingertight Fittings

The Rheodyne RheFlex Precision Two-Piece PEEK Fittings sets provide inert, biocompatible connections for instrumentation. These fittings have a reliable, time tested design. Also offered in this product line is the 6000-078 fitting, designed to connect 1/8" OD tubing into our manual preparative-scale injection valves.

RHEODYNE RHEFLEX FINGERTIGHT FITTINGS

PART NO	DESCRIPTION	TUBING OD	PORT	PRESSURE RATING	HEAD STYLE	MATERIAL	QTY
RHEFLEX TWO-PIECE FITTINGS (INCLUDES FERRULES)							
6000-078	Fitting	1/8"	5/16-24 Coned	5,000 PSI	5/16" Hex	PEEK, Nat	ea
6000-079	Repl Ferrules	1/8"	5/16-24 Coned	7,000 PSI	ChromTRAC knob	PEEK, Nat	5/pk
6000-054	Fitting	1/16"	10-32 Coned	7,000 PSI	ChromTRAC knob	PEEK, Nat	5/pk
6000-254	Fitting	1/16"	10-32 Coned	7,000 PSI	ChromTRAC knob	PEEK, Nat	10/pk
6000-255	Fitting, Short	1/16"	10-32 Coned	7,000 PSI	1/4" Hex	PEEK, Nat	10/pk
6000-051	Repl Ferrules	1/16"	10-32 Coned	7,000 PSI	ChromTRAC knob	PEEK, Nat	5/pk
6000-251	Repl Ferrules	1/16"	10-32 Coned	7,000 PSI	ChromTRAC knob	PEEK, Nat	10/pk
RHEFLEX ONE-PIECE FITTINGS							
6000-282	Fitting	1/16"	10-32 Coned	5,000 PSI	ChromTRAC knob	PEEK, Nat	10/pk
6000-360	Fitting	1/32"	M4 Coned	5,000 PSI	1/4" Hex	PEEK, Nat	10/pk



Upchurch Scientific® Fingertight Fittings

UPCHURCH SCIENTIFIC ONE-PIECE FINGERTIGHT FITTINGS

PART NO	DESCRIPTION	TUBING OD	PORT	PRESSURE RATING	INCLUDES FERRULE	QTY
F-100	PCTFE, Red, One-Piece Fitting	1/16"	10-32 Coned	4,000 PSI	N/A	ea
F-120	PEEK One-Piece Fitting	1/16"	10-32 Coned	5,000 PSI	N/A	ea
F-130	PEEK One-Piece Fitting, Long	1/16"	10-32 Coned	5,000 PSI	N/A	ea
M-645	PEEK/PCTFE One-Piece Fitting	1/32"	6-40 Coned	1,750 – 3250 PSI	N/A	ea
P-100	PCTFE One-Piece Fitting	1/8"	1/4-28 Coned	1,000 PSI	N/A	ea

UPCHURCH SCIENTIFIC TWO-PIECE FINGERTIGHT FITTINGS

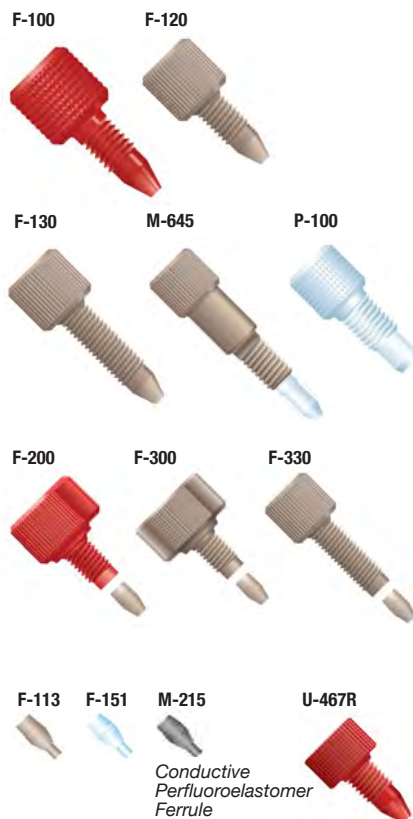
F-200	Delrin Nut, Single Wing	1/16"	10-32 Coned	6,000 PSI	F-142 (PEEK)	ea
F-300	PEEK Nut, Double Wing	1/16"	10-32 Coned	6,000 PSI	F-142 (PEEK)	ea
F-330	PEEK Nut, Standard Knurl, Long	1/16"	10-32 Coned	6,000 PSI	F-142 (PEEK)	ea
F-330	PEEK Nut, Standard Knurl	1/16"	10-32 Coned	6,000 PSI	F-142 (PEEK)	ea

FERRULE OPTIONS FOR TWO-PIECE FINGERTIGHT FITTINGS

F-113	PEEK Natural Ferrule	1/32"	10-32 Coned	6,000 PSI	—	ea
F-142	PEEK Natural Ferrule	1/16"	10-32 Coned	6,000 PSI	—	ea
F-142N	ETFE Natural Ferrule	1/16"	10-32 Coned	4,000 PSI	—	ea
F-148	PCTFE Natural Ferrule	190 µm	10-32 Coned	6,000 PSI	—	ea
F-151	PCTFE Natural Ferrule	360 µm	10-32 Coned	6,000 PSI	—	ea
M-215	Conductive Ferrule	360 µm	10-32 Coned	1,500 PSI	—	ea

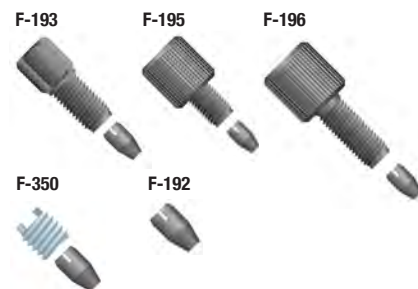
PLUGS

P-551	PEEK Natural Plug	—	10-32 Coned	—	N/A	ea
U-467R	Delrin Red Plug	—	10-32 Coned	—	N/A	ea



Two-Piece SealTight™ Fingertight Fittings

- ➔ Designed to connect 1/16" OD tubing to 10-32 coned ports
- ➔ Hold up to 9,000 PSI (620 bar)
- ➔ Dual compression system—slotted end creates second compression zone

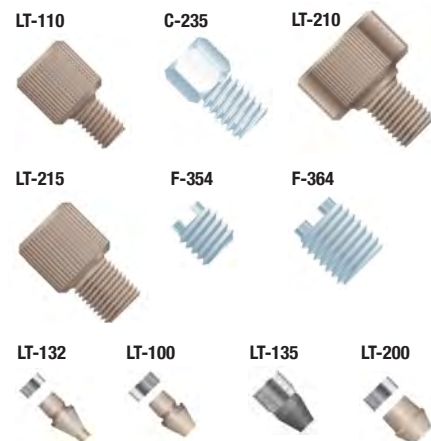


SEALTIGHT TWO-PIECE FITTINGS						
PART NO	DESCRIPTION	PORT	PRESSURE RATING	HEAD STYLE	MATERIAL	QTY
SEALTIGHT TWO-PIECE FITTINGS (INCLUDES F-192 FERRULES)						
F-193	SealTight Fitting for 1/16" OD Tubing, Short	10-32 Coned	7,000 – 9,000 PSI	1/4" Hex	PEEK Black	ea
F-195	SealTight Fitting for 1/16" OD Tubing, Short	10-32 Coned	7,000 – 9,000 PSI	Standard Knurl	PEEK Black	ea
F-196	SealTight Fitting for 1/16" OD Tubing, Long	10-32 Coned	7,000 – 9,000 PSI	Standard Knurl	PEEK Black	ea
F-287	SealTight Fitting for 1/16" OD Tubing, Long	10-32 Coned	7,000 – 9,000 PSI	Knurl-1/4" Hex	PEEK Black	ea
F-350	SealTight Fitting for 1/16" OD Tubing, FlushNut	10-32 Coned	7,000 – 9,000 PSI	FlushNut	SST	ea
F-192	SealTight Ferrules for 1/16" OD Tubing	10-32 or M6 Coned	7,000 – 9,000 PSI	—	PEEK/Black	ea

LiteTouch® Fittings

- ➔ Helps prevent twisting of polymer tubing
- ➔ Two compression points—holding to high pressure with fingertight convenience
- ➔ Options available for 1/32", 1/6", or 1/8" OD tubing

To avoid collapsing the ID of your tubing, the LiteTouch system can be used on hard tubing only, such as stainless steel and PEEK polymer tubing. The LiteTouch Ferrule System is not recommended for repeated use in plastic ports.



TECH TIP

The stainless steel nuts on page 226 can also be used with the LiteTouch ferrules on this page.

LITETOUGH FITTINGS						
PART NO	DESCRIPTION	PORT	PRESSURE RATING	HEAD STYLE	MATERIAL	QTY
LITETOUGH NUTS						
C-235	LiteTouch Nut for 1/8" OD Tubing	1/4-28 Coned	4,500 PSI (310 bar)	5/16" Hex	SST	ea
F-354	LiteTouch Nut for 1/16" or 1/32" OD Tubing, FlushNut	10-32 Coned	5,000 PSI (345 bar)	FlushNut	SST	ea
F-364	LiteTouch Nut for 1/8" OD Tubing, FlushNut	1/4-28 Coned	4,500 PSI (310 bar)	FlushNut	SST	ea
LT-110	LiteTouch Nut for 1/16" or 1/32" OD Tubing	10-32 Coned	5,000 PSI (345 bar)	Standard Knurl	PEEK Natural	ea
LT-210	LiteTouch Nut for 1/8" OD Tubing	1/4-28 Coned	4,500 PSI (310 bar)	Double Wing	PEEK Natural	ea
LT-215	LiteTouch Nut for 1/8" OD Tubing, Short	1/4-28 Coned	4,500 PSI (310 bar)	Standard Knurl	PEEK Natural	ea
LITETOUGH FERRULES						
LT-100	LiteTouch Ferrule for 1/16" OD Tubing	10-32 Coned	5,000 PSI (345 bar)	—	PEEK Natural/SST	ea
LT-132	LiteTouch Ferrule for 1/32" OD Tubing	10-32 Coned	5,000 PSI (345 bar)	—	PEEK Natural/SST	ea
LT-135	LiteTouch Ferrule for 1/16" OD Tubing	10-32 Coned	10,000 PSI (690 bar)*	—	PEEK Black/SST	ea
LT-200	LiteTouch Ferrule for 1/8" OD Tubing	1/4-28 Coned	4,500 PSI (310 bar)	—	PEEK Natural/SST	ea

Stainless Steel Fittings

These 316 Stainless Steel Fittings are rated to 20,000 PSI (1,380 bar) when wrench tightened. Choose Upchurch Scientific® Standard Fittings, or select from the Rheodyne® or other manufacturer-compatible offerings.

Standard Stainless Steel Fittings

C-235/C-236

U-400/U-401

U-450/U-401



Rheodyne Fittings

6000-209

6000-211

6000-262

6000-082



SSI
Compatible Fittings
U-350



VICI® (Valco)
Compatible Fittings
U-320/U-321



Beckman® Compatible Fittings

U-420/U-401

U-401



Waters® Compatible Fittings

U-410/U-401



TECH TIP

Do not use metal fittings in plastic ports, as this can damage the port. The recommended torque to tighten these fittings is 20 in-lbs (2.25 N-m).

STAINLESS STEEL FITTINGS

PART NO	DESCRIPTION	PORT	PRESSURE RATING	HEAD STYLE	MATERIAL	QTY
STANDARD STAINLESS STEEL FITTINGS						
C-235	Nut for 1/8" OD Tubing	1/4-28 Coned	20,000 PSI (1,380 bar)	5/16" Hex	SST	ea
C-236	Ferrule for 1/8" OD Tubing	1/4-28 Coned	20,000 PSI (1,380 bar)	—	SST	ea
U-400	Nut for 1/16" OD Tubing	10-32 Coned	20,000 PSI (1,380 bar)	1/4" Hex	SST	ea
U-401X	Ferrule for 1/16" OD Tubing	10-32 or M6 Coned	20,000 PSI (1,380 bar)	—	SST	10/pk
U-450	Nut for 1/16" OD Tubing	M6 Coned	20,000 PSI (1,380 bar)	5/16" Hex	SST	ea
RHEODYNE FITTINGS						
6000-082	Fitting for 1/8" OD Tubing	5/16-24 Coned	20,000 PSI (1,380 bar)	5/16" Hex	SST	ea
6000-083	Ferrule for 1/8" OD Tubing	5/16-24 Coned	20,000 PSI (1,380 bar)	—	SST	5/pk
7010-009	Fitting for 1/16" OD Tubing	10-32 Coned	20,000 PSI (1,380 bar)	1/4" Hex	SST	ea
6000-209	Fitting for 1/16" OD Tubing	10-32 Coned	20,000 PSI (1,380 bar)	1/4" Hex	SST	10/pk
7010-010	Ferrule for 1/16" OD Tubing	10-32 Coned	20,000 PSI (1,380 bar)	—	SST	ea
6000-210	Ferrule for 1/16" OD Tubing	10-32 Coned	20,000 PSI (1,380 bar)	—	SST	10/pk
7010-011	Fitting for 1/16" OD Tubing, Long	10-32 Coned	20,000 PSI (1,380 bar)	1/4" Hex	SST	ea
6000-211	Fitting for 1/16" OD Tubing, Long	10-32 Coned	20,000 PSI (1,380 bar)	1/4" Hex	SST	10/pk
7010-062	Fitting for 1/16" OD Tubing, Extra Long	10-32 Coned	20,000 PSI (1,380 bar)	1/4" Hex	SST	ea
6000-262	Fitting for 1/16" OD Tubing, Extra Long	10-32 Coned	20,000 PSI (1,380 bar)	1/4" Hex	SST	10/pk
MANUFACTURER COMPATIBLE FITTINGS						
U-320	Nuts for 1/16" OD Tubing, Valco/VICI Compatible	10-32 Coned	20,000 PSI (1,380 bar)	1/4" Hex	SST	ea
U-321	Ferrule for 1/16" OD Tubing, Valco/VICI Compatible	10-32 Coned	20,000 PSI (1,380 bar)	—	SST	ea
U-350	Nuts for 1/16" OD Tubing, SSI Compatible	10-32 Coned	20,000 PSI (1,380 bar)	5/16" Hex	SST	ea
U-410	Nuts for 1/16" OD Tubing, Waters Compatible	10-32 Coned	20,000 PSI (1,380 bar)	5/16" Hex	SST	ea
U-420	Nuts for 1/16" OD Tubing, Beckman Compatible	10-32 Coned	20,000 PSI (1,380 bar)	1/4" Hex	SST	ea

Very High Pressure PK Fittings

Upchurch Scientific® Ultra High Performance fittings are manufactured from a proprietary PEEK blend (PK) which allow them to be used at higher temperatures (up to 200 °C) and higher pressures.

The VHP PK, One-Piece fittings are available for 10-32 coned, 6-32 coned, or M4 coned ports, and Two-Piece fittings are available to connect either 1/16" or 1/32" OD tubing into 10-32 coned ports in multiple styles.

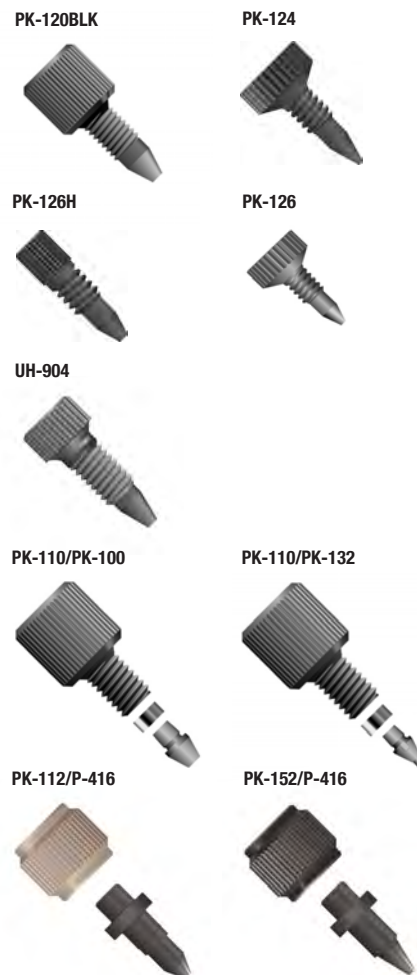
VHP MicroFerrules

VHP MicroFerrules are made from a proprietary high performance PEEK polymer blend, a material which is unique in its ability to enable the use of capillary tubing in UHPLC environments. The new high pressure MicroFerrules are available for use with 1/32" or 360 µm OD tubing, and they are incorporated into several of our VHP products for capillary tubing.

TECH TIP

CAUTION: While the proprietary blend of the PK fittings will allow a fitting to attain a higher pressure and minimal cold flow properties relative to pure PEEK, some fittings molded of PK are known to be conductive. Use caution when employing PK fittings in high voltage applications.

While the MicroTight Ferrule Nuts may be used with any of the separate MicroFerrules, the MicroFerrules themselves are port-specific and are thus not interchangeable. Additionally, the one-piece MicroTight fittings are also port-specific and should not be exchanged.



PK VHP FITTINGS							
PART NO	DESCRIPTION	PORT	PRESSURE	REQUIRED TORQUE	HEAD STYLE	MATERIAL	QTY
PK VHP ONE-PIECE FITTINGS							
PK-120BLK	PK One-Piece Fitting for 1/16" OD Tubing	10-32 Coned	12,000 PSI	8.0 in-lbs (0.90 N·m)	Standard Knurl	PK	ea
PK-124	PK One-Piece Fitting for 360 µm OD Tubing	6-32 Coned	15,000 PSI	3.0 in-lbs (0.34 N·m)	Standard Micro Knurl	PK	ea
PK-126H	PK One-Piece Headless Fitting for 1/32" OD Tubing	6-32 Coned	15,000 PSI	3.0 in-lbs (0.34 N·m)	Headless Micro Knurl	PK	ea
PK-126	PK One-Piece Fitting for 1/32" OD Tubing	6-32 Coned	15,000 PSI	3.0 in-lbs (0.34 N·m)	Standard Micro Knurl	PK	ea
UH-904	PK One-Piece Fitting for 1/32" OD Tubing	M4 Coned	15,000 PSI	4.0 in-lbs (0.45 N·m)	Headless Knurl	PK	ea
PK VHP FITTINGS (LITETOUGH® STYLE, NUTS AND FERRULES SOLD SEPARATELY)							
PK-100X	PK Ferrule for 1/16" OD Tubing	10-32 Coned	16,500 PSI	—	—	PK	10/pk
PK-110X	PK Nut for 1/16" OD Tubing	10-32 Coned	16,500 PSI	8.0 in-lbs (0.90 N·m)	Standard Knurl	PK	10/pk
PK-132	PK Ferrule for 1/32" OD Tubing	10-32 Coned	16,500 PSI	—	—	PK	ea
PK MICROFERRULES AND FEMALE NUTS							
P-416	Ferrule Nut for MicroFerrule	5/16-24 Coned	15,000 PSI	4.0 in-lbs (0.45 N·m)	Female Knurl	PEEK, Natural	ea
P-416BLK	Ferrule Nut for MicroFerrule	5/16-24 Coned	15,000 PSI	4.0 in-lbs (0.45 N·m)	Female Knurl	PEEK, Black	ea
PK-112	VHP MicroFerrule for 1/32" OD Tubing	5/16-24 Coned	15,000 PSI	—	—	PK	ea
PK-152	VHP MicroFerrule for 360 µm OD Tubing	5/16-24 Coned	15,000 PSI	—	—	PK	ea

Very High Pressure (VHP) Fittings

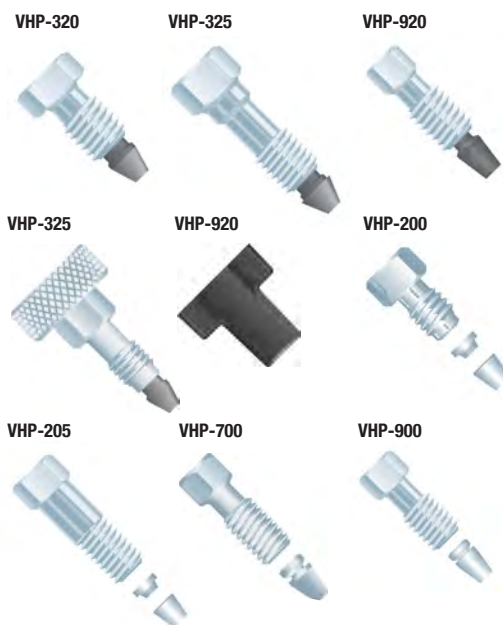
➔ Available in 10-32 threads for 1/16" OD tubing and M4 threads for 1/32" OD

Reusable VHP Fittings

Capable of up to ten repeat assembly cycles with no impact on pressure holding ability or carry-over. With a polymer front ferrule, there is no damage to the tubing or receiving port, also increasing the life of these components.

Stainless Steel VHP Fittings

The all Stainless Steel VHP Fittings include a unique ferrule system with two compression points to provide twice the grip of a standard ferrule. This design also allows the bite on the tubing to be less concentrated and does not restrict the inner diameter. The ferrules for 1/16" OD tubing and 10-32 coned ports are two pieces, while the grooved ferrule for 1/32" OD tubing and M4 coned ports is a one piece design for easier handling, but it will act as two pieces with double compression on the tubing as it is tightened down.



REUSABLE VHP FITTINGS

PART NO	DESCRIPTION	PORT	PRESSURE RATING	REQUIRED TORQUE	HEAD STYLE	MATERIAL	QTY
VHP-320	VHP Fitting for 1/16" OD	10-32 Coned	25,000 PSI (1,720 bar)	10 in-lbs (1.10 N-m)	1/4" Hex	SST/PK	ea
VHP-321	VHP Fitting for 1/16" OD	10-32 Coned	25,000 PSI (1,720 bar)	10 in-lbs (1.10 N-m)	8 mm Hex	SST/PK	ea
VHP-325	VHP Fitting for 1/16" OD, Long	10-32 Coned	25,000 PSI (1,720 bar)	10 in-lbs (1.10 N-m)	1/4" Hex	SST/PK	ea
VHP-326	VHP Fitting for 1/16" OD, Long	10-32 Coned	25,000 PSI (1,720 bar)	10 in-lbs (1.10 N-m)	8 mm Hex	SST/PK	ea
VHP-900	VHP Fitting for 1/32" OD	M4 Coned	30,000 PSI (2,070 bar)	20 in-lbs (2.25 N-m)	4 mm Hex	SST	ea
VHP-920	VHP Fitting for 1/32" OD	M4 Coned	25,000 PSI (1,720 bar)	8 in-lbs (0.90 N-m)	4 mm Hex	SST/PK	ea
VHP-3200	VHP Fitting for 1/16" OD	10-32 Coned	11,000 PSI (760 bar)	3.5 in-lbs (0.40 N-m)	1/2 Knurl	SST/PK	ea
VHP-1001	VHP Fingertight 1/4" Hex Tool	—	—	—	—	PPS	ea

STAINLESS STEEL VHP FITTINGS

STAINLESS STEEL VHP FITTINGS (INCLUDES NUT AND FERRULE)

VHP-200	VHP Fitting for 1/16" OD	10-32 Coned	30,000 PSI (2,000 bar)	20 in-lbs (2.25 N-m)	1/4" Hex	SST	ea
VHP-205	VHP Fitting for 1/16" OD, Long	10-32 Coned	30,000 PSI (2,000 bar)	20 in-lbs (2.25 N-m)	1/4" Hex	SST	ea
VHP-900	VHP Fitting for 1/32" OD	M4 Coned	30,000 PSI (2,000 bar)	20 in-lbs (2.25 N-m)	4 mm Hex	SST	ea
VHP-700X	VHP Fitting for 1/32" OD	6-40 Coned	30,000 PSI (2,000 bar)	20 in-lbs (2.25 N-m)	4 mm Hex	SST	10/pk

STAINLESS STEEL VHP FERRULES

VHP-200-01	VHP Ferrule for 1/16" OD	10-32 Coned	30,000 PSI (2,000 bar)	20 in-lbs (2.25 N-m)	—	SST	ea
VHP-900-01X	VHP Ferrule for 1/32" OD	M4 Coned	30,000 PSI (2,000 bar)	20 in-lbs (2.25 N-m)	—	SST	10/pk

VHP TIGHTENING TOOLS

VHP-1000	VHP Torque Tool, torque delivered: 10 in-lbs (1.13 N-m)				1/4" Hex		ea
VHP-2000	VHP Torque Tool, torque delivered: 14 in-lbs (1.58 N-m)				1/4" Hex		ea
VHP-9000	4 mm Wrench				4 mm Hex		ea

Optimize EXP[®]2 Fittings for Hand-Tight UHPLC Connections

- ➔ Rated Hand-Tight to 20,000+ PSI (1,400+ bar)
- ➔ Auto-adjusting, zero-dead-volume connection
- ➔ Extremely robust one-piece ferrule design
- ➔ Perfect for standard or nano UHPLC and UHPLC/MS
- ➔ Made in U.S.A.

OPTIMIZE EXP2 FITTING WITH EXP FERRULE

NEW!

PART NO	TUBING OD	NUT	FERRULE	DRIVER
15-20-04933	1/16", SS or PEEK	(2) 10-32 EXP2 Nut	(2) EXP Ferrule	(1) EXP2 Driver
15-20-04924	1/16", SS or PEEK	(10) 10-32 EXP2 Nut	(10) EXP Ferrule	(1) EXP2 Driver
15-24-03832	Replacement EXP Ferrules for 1/16" OD Tubing, 10/pk			

OPTIMIZE EXP2 FITTING WITH Ti-LOK FERRULE

NEW!

PART NO	TUBING OD	NUT	FERRULE	DRIVER
15-20-04932	1/16", PEEKsil	(2) 10-32 EXP2 Nut	(2) Ti-LOK Ferrule	(1) EXP2 Driver
15-20-04920	1/16", PEEKsil	(10) 10-32 EXP2 Nut	(10) Ti-LOK Ferrule	(1) EXP2 Driver
15-19-04930	1/32", PEEKsil	(2) 6-32 EXP2 Nut	(2) Ti-LOK Ferrule	(1) EXP2 Driver
15-19-04929	1/32", PEEKsil	(10) 6-32 EXP2 Nut	(10) Ti-LOK Ferrule	(1) EXP2 Driver
15-19-04931	1/32", PEEKsil	(2) 6-40 EXP2 Nut	(2) Ti-LOK Ferrule	(1) EXP2 Driver
15-19-04927	1/32", PEEKsil	(10) 6-40 EXP2 Nut	(10) Ti-LOK Ferrule	(1) EXP2 Driver

OPTIMIZE EXP FITTINGS FOR 1/16" OD TUBING (SS OR PEEK)

PART NO	DESCRIPTION	QTY
15-20-03930	10-32 Hand-Tight EXP Nut & EXP Ferrule	10/pk
15-24-03832	Replacement EXP Ferrules	10/pk



CHROM TECH RELATED PRODUCTS

VICI 316 STAINLESS STEEL SPECIFICATIONS

OD	PRESSURE RATING	OD TOLERANCE	ID TOLERANCE
1/16"	5300 PSI (365 bar)	± 0.05 mm (.002")	± 0.025 mm (.001")

VICI PRECUT STAINLESS STEEL (2/PK), 1/16" OD

PART NO	ID	LENGTH
T30C5D	0.005" (0.125 mm)	12" (30 cm)
T50C5D	0.005" (0.125 mm)	1.6' (50 cm)
T20C10D	0.010" (0.25 mm)	8" (20 cm)
T30C10D	0.010" (0.25 mm)	12" (30 cm)
T50C10D	0.010" (0.25 mm)	1.6' (50 cm)
T20C20D	0.020" (0.5 mm)	8" (20 cm)
T30C20D	0.020" (0.5 mm)	12" (30 cm)
T50C20D	0.020" (0.5 mm)	1.6' (50 cm)
T20C30D	0.030" (0.75 mm)	8" (20 cm)
T30C30D	0.030" (0.75 mm)	12" (30 cm)
T50C30D	0.030" (0.75 mm)	1.6' (50 cm)

Snap ring allows for easy connection between EXP2 Nut and Driver

EXP2 Nut
6-32, 6-40 & 10-32
Configurations

EXP2 Slotted
Nut Driver



Titanium
Enables the swage to be released and reset. Intended for many repeat connections.

PEEK
Proven Sealing ability beyond 20,000 PSI (1,400 bar)

EXP Ferrule



Ti-LOK Ferrule

Ti-LOK Ferrule incorporates inverted Titanium + PEEK Hybrid design

Ti-LOK Ferrule technology prevents delamination of PEEKsil tubing by bottom-of-the-port sealing



EXP Nut

EXP Ferrule

Hand-tight to 8,700 PSI
Wrench-tight to 20,000 PSI

TECH TIP

Due to the tight tolerances of the EXP ferrule, we recommend using VICI tubing if Stainless Steel tubing is preferred. For complete listing, see page 258.

Agilent A-Line Quick Turn Fitting

- ➔ Hand tight to 600 bar
- ➔ Up to 1,300 bar—when using a wrench to tighten 1/4 to 1/2 turn past hand tight

In a tight spot? Try an A-Line Quick Turn fitting

For instrument connections that are too tight for A-Line Quick Connect fittings, you can rely on Agilent A-Line Quick Turn fittings. Like our Quick Connect fittings, they leverage a proprietary spring-loaded design for zero dead volume and a sure connection.

Note: These fittings can only be used with capillaries using a long socket. See the ordering information for a list of available capillaries.



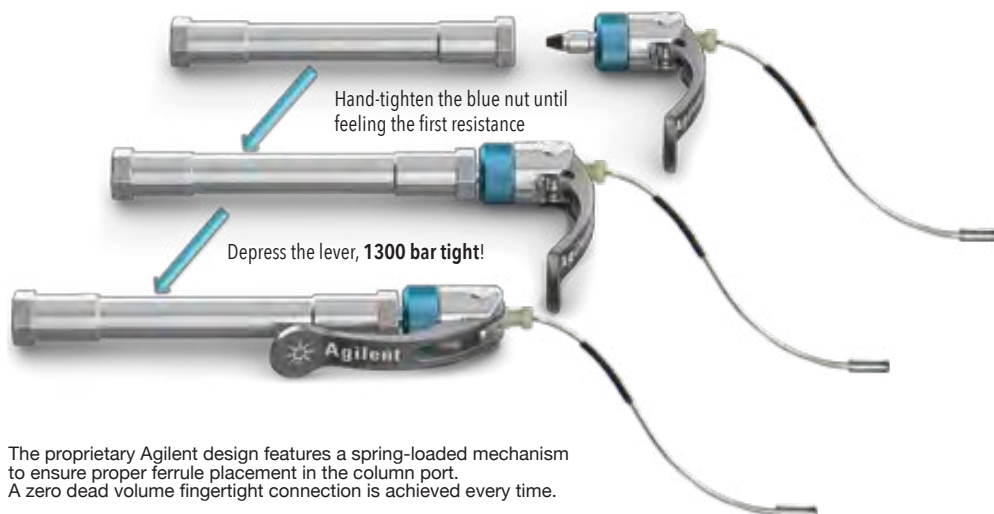
AGILENT A-LINE QUICK TURN FITTINGS		
PART NO	DESCRIPTION	QTY
FITTINGS AND FERRULES		
5067-5966	Quick Turn UHPLC fitting	ea
5043-0924	Front ferrule	ea
CAPILLARY TUBING REQUIRED FOR USE WITH QUICK TURN FITTING		
5500-1198	Stainless steel, 0.075 ID x 105 mm long socket	ea
5500-1232	Stainless steel, 0.075 ID x 150 mm long socket	ea
5500-1188	Stainless steel, 0.12 ID x 105 mm long socket	ea
5500-1189	Stainless steel, 0.12 ID x 150 mm long socket	ea
5500-1233	Stainless steel, 0.12 ID x 180 mm long socket	ea
5500-1190	Stainless steel, 0.12 ID x 200 mm long socket	ea
5500-1191	Stainless steel, 0.12 ID x 280 mm long socket	ea
5500-1192	Stainless steel, 0.12 ID x 500 mm long socket	ea
5500-1193	Stainless steel, 0.17 ID x 105 mm long socket	ea
5500-1194	Stainless steel, 0.17 ID x 150 mm long socket	ea
5500-1234	Stainless steel, 0.17 ID x 180 mm long socket	ea
5500-1195	Stainless steel, 0.17 ID x 200 mm long socket	ea
5500-1196	Stainless steel, 0.17 ID x 280 mm long socket	ea
5500-1235	Stainless steel, 0.17 ID x 380 mm long socket	ea
5500-1236	Stainless steel, 0.17 ID x 400 mm long socket	ea
5500-1197	Stainless steel, 0.17 ID x 500 mm long socket	ea
5500-1237	Stainless steel, 0.17 ID x 500 mm long socket	ea

TECH TIP

The A-Line Quick Turn LC fitting can be used multiple times with different capillaries, without loss of performance.

Agilent A-Line Quick Connect Fitting

Poorly connected fittings are one of the top reasons for broad or tailing peaks, loss of resolution, and overall poor chromatography. Now with Agilent A-Line Quick Connect fittings you can be sure you're getting a perfect column connection, every time.




The proprietary Agilent design features a spring-loaded mechanism to ensure proper ferrule placement in the column port. A zero dead volume fingertight connection is achieved every time.

- **True fingertight connection:** No special training is needed, so differences in user style will not affect your chromatography
- **Spring-loaded design** for zero dead volume connections with all types of UHPLC columns—as easy as closing a lever
- **Reliable and reusable:** A-Line Quick Connect fittings are long lasting, reseal tightly, and are stable up to 1300 bar (18,850 PSI) even after 200+ reconnections
- **Fast, easy connections** that save you time and trouble

AGILENT A-LINE QUICK CONNECT FITTINGS

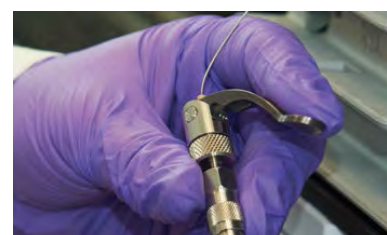
COMPLETE ASSEMBLY*	CAPILLARY TUBING ID X LENGTH	RECOMMENDED FOR	REPLACEMENT TUBING**
5067-5961	0.075 ID x 105 mm	Heat exchanger to column	5500-1174
5067-6163	0.075 ID x 150 mm		5500-1175
5067-6164	0.075 ID x 220 mm		5500-1176
5067-6165	0.075 ID x 280 mm		5500-1177
5067-5957	0.12 ID x 105 mm	Heat exchanger to column	5500-1173
5067-5958	0.12 ID x 150 mm	Heat exchanger to column	5500-1172
5067-5959	0.12 ID x 220 mm	Column to detector	5500-1171
5067-5960	0.12 ID x 280 mm	Column to detector	5500-1170
5067-6166	0.17 ID x 105 mm		5500-1181
5067-6167	0.17 ID x 150 mm		5500-1182
5067-6168	0.17 ID x 220 mm		5500-1183
5067-6169	0.17 ID x 280 mm		5500-1230

REPLACEMENT FITTINGS

PART NO	DESCRIPTION
5043-0924	Front ferrule
5067-5965	Stand-alone Quick Connect fitting (pair with the appropriate capillary for your system setup)
5062-2418	Swagelok stainless steel fitting, 10/pk 

* All assemblies include one Quick Connect fitting/ferrule attached to the appropriate capillary, and a non-swaged Swagelok fitting on the opposite end.

** Quick Connect fittings can only be used with the capillaries specified in this table.

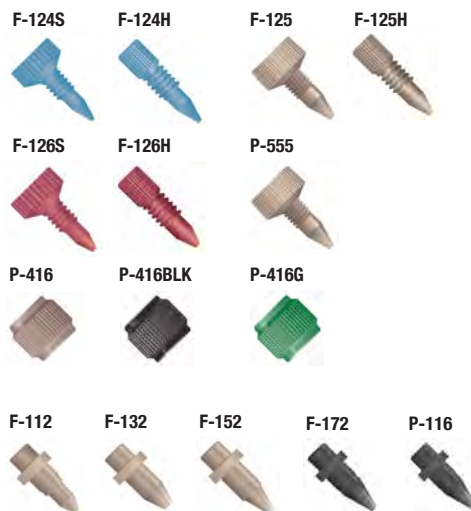


MicroTight® Fittings and Sleeves

- ➔ Designed for use with the NanoPort™ and MicroTight Unions, Adapters, and Inline MicroFilters
- ➔ Specifically made for 360 µm OD tubing, 1/32" OD tubing, or our MicroTight Tubing Sleeves
- ➔ MicroTight Fittings withstand temperatures up to 125 °C

TECH TIP

While the MicroTight Female Nuts may be used with any of the separate MicroFerrules, the MicroFerrules themselves are port-specific and are thus not interchangeable. Additionally, the one-piece MicroTight fittings are also port-specific and should not be exchanged.



MICROTIGHT FITTINGS						
PART NO	DESCRIPTION	PORT	PRESSURE RATING	HEAD STYLE	MATERIAL	QTY
F-124H	Microtight Fitting for 360 µm OD Tubing	6-32 Coned	5,000 PSI (345 bar)	Micro Headless Knurl	PEEK Blue	ea
F-124S	Microtight Fitting for 360 µm OD Tubing	6-32 Coned	5,000 PSI (345 bar)	Standard Micro Knurl	PEEK Blue	ea
F-125H	Microtight Fitting for MicroTight Tubing Sleeves	6-32 Coned	4,000 PSI (276 bar)	Micro Headless Knurl	PEEK Natural	ea
F-125	Microtight Fitting for MicroTight Tubing Sleeves	6-32 Coned	4,000 PSI (276 bar)	Standard Micro Knurl	PEEK Natural	ea
F-126H	Microtight Fitting for 1/32" OD Tubing	6-32 Coned	5,000 PSI (345 bar)	Micro Headless Knurl	PEEK Red	ea
F-126S	Microtight Fitting for 1/32" OD Tubing	6-32 Coned	5,000 PSI (345 bar)	Standard Micro Knurl	PEEK Red	ea
P-555	Microtight Plug	6-32 Coned	5,000 PSI (345 bar)	Standard Micro Knurl	PEEK Natural	ea
MICROFERRULES & FEMALE NUTS						
F-112	MicroFerrule for 1/32" OD Tubing	5/16-24 Coned	5,000 PSI (345 bar)	—	PEEK Natural	ea
F-132	MicroFerrule for 1/16" OD Tubing	5/16-24 Coned	5,000 PSI (345 bar)	—	PEEK Natural	ea
F-152	MicroFerrule for 360 µm OD Tubing	5/16-24 Coned	5,000 PSI (345 bar)	—	PEEK Natural	ea
F-152BLK	MicroFerrule for 360 µm OD Tubing	5/16-24 Coned	5,000 PSI (345 bar)	—	PEEK Black	ea
F-172	MicroFerrule for MicroTight Tubing Sleeves	5/16-24 Coned	4,000 PSI (276 bar)	—	PEEK Black	ea
P-116	MicroFerrule Plug	5/16-24 Coned	5,000 PSI (345 bar)	—	PEEK Black	ea
P-416	MicroTight Female Nut	5/16-24 Coned	4,000 – 5,000 PSI	Female Knurl	PEEK Natural	ea
P-416BLK	MicroTight Female Nut	5/16-24 Coned	4,000 – 5,000 PSI	Female Knurl	PEEK Black	ea
P-416G	MicroTight Female Nut	5/16-24 Coned	4,000 – 5,000 PSI	Female Knurl	PEEK Green	ea

MICROTIGHT TUBING SLEEVES				
MICROTIGHT	ID	FOR TUBING OD SIZE	COLOR	QTY
F-180	0.005" (125 µm)	70 – 110 µm	Red	ea
F-181	0.007" (180 µm)	125 – 165 µm	Yellow	ea
F-182	0.009" (230 µm)	175 – 215 µm	Natural	ea
F-183	0.011" (280 µm)	225 – 265 µm	Blue	ea
F-184	0.013" (330 µm)	275 – 315 µm	Orange	ea
F-185	0.0155" (395 µm)	340 – 380 µm	Green	ea
F-186	0.018" (455 µm)	400 – 440 µm	Black	ea
F-187	0.021" (535 µm)	480 – 520 µm	Natural	ea
1328	MicroTight Tubing Sleeve Kit contains (6) each of all MicroTight Tubing Sleeves above			
1356	MicroTight Connector Kit contains a 10/pk of each MicroTight Tubing Sleeves F-180 – F-187 (F-188 not included); (2) P-770 MicroTight Adapters; and (2) MicroTight P-720 Unions.			

TECH TIP

Selecting the Correct Sleeve

To use these sleeves properly, choose a sleeve with an inner diameter 0.001" – 0.002" (25 – 50 µm) larger than the outer diameter of your capillary tubing.

Tubing Sleeves

TECH TIP

1/16" OD Tubing Sleeves

These sleeves require a wrench tightened nut to achieve proper sealing. We recommend the hex-head SealTight™ fittings on page 225. Many researchers also use a stainless steel nut and ferrule with these sleeves, such as our U-400 and U-401 on page 226.

Use 1/32" OD PEEK or FEP sleeves to connect capillary tubing with the following:

- ➔ The F-113 Ferrule & Two-Piece Fingertight Fittings for 10-32 ports (224)
- ➔ The F-112 and P-416BLK MicroTight® Fittings (page 232) – 1/32" OD PEEK Tubing Sleeves only
- ➔ The 1/32" OD MicroTight Fittings on page 232
- ➔ The Rheodyne® RheFlex M4 Fitting (page 224) for MX Module applications; the M-645 Valco®-Compatible Fitting (page 224)



Fittings and tubing only shown to highlight how sleeves are designed to be used; they are not included with the sleeves.

TUBING SLEEVES

PART NO	ID	FOR TUBING OD SIZE	MAX TEMP	MAX PRESSURE	COLOR
PEEK TUBING SLEEVES FOR 1/16" OD FITTINGS					
F-225	0.005" (125 µm)	70 – 110 µm	125 °C	6,000 PSI	Red
F-226	0.007" (180 µm)	125 – 165 µm	125 °C	6,000 PSI	Yellow
F-227	0.009" (230 µm)	175 – 215 µm	125 °C	6,000 PSI	Yellow
F-228	0.011" (250 µm)	225 – 265 µm	125 °C	6,000 PSI	Blue
F-229	0.013" (330 µm)	275 – 315 µm	125 °C	6,000 PSI	Natural
F-230	0.016" (405 µm)	350 – 390 µm	125 °C	6,000 PSI	Orange
F-231	0.022" (560 µm)	505 – 545 µm	125 °C	6,000 PSI	Natural
F-234	0.027" (685 µm)	630 – 670 µm	125 °C	6,000 PSI	Yellow
F-232	0.031" (785 µm)	730 – 770 µm	125 °C	6,000 PSI	Natural
F-233	0.034" (865 µm)	785 – 825 µm	125 °C	6,000 PSI	Blue
PEEK TUBING SLEEVES FOR 1/32" OD FITTINGS					
F-381	0.007" (180 µm)	125 – 165 µm	125 °C	5,000 PSI	Yellow
F-382	0.008" (205 µm)	150 – 190 µm	125 °C	5,000 PSI	Natural
F-384	0.010" (255 µm)	200 – 240 µm	125 °C	5,000 PSI	Blue
F-387	0.011" (280 µm)	225 – 265 µm	125 °C	5,000 PSI	Red
F-388	0.013" (330 µm)	275 – 315 µm	125 °C	5,000 PSI	Black
F-385	0.015" (380 µm)	325 – 365 µm	125 °C	5,000 PSI	Natural
F-386	0.020" (510 µm)	455 – 495 µm	125 °C	5,000 PSI	Orange
FEP TUBING SLEEVES FOR 1/32" OD FITTINGS					
F-374	0.011" (280 µm)	225 – 265 µm	50 °C	1,750 PSI	Blue
F-375	0.013" (330 µm)	275 – 315 µm	50 °C	1,750 PSI	Orange
F-376	0.0155" (395 µm)	340 – 380 µm	50 °C	1,750 PSI	Green

Why Use Sleeves?

Because most capillary tubing connections are made into coned receiving ports, where the port is not designed to be used with capillary tubing directly, special care must be used to ensure a good connection. While custom ferrules can help make these connections, they only offer a fixed-length nose—and because most tubing pockets will vary slightly in length, this can lead to leaking or dead volume.

To help save overall expense while maintaining a concentric connection with minimal dead volume, IDEX Health Science recommends the use of sleeves. Because sleeves are not permanently attached to a ferrule, they can easily adapt to varying tubing pocket depths. Additionally, because they are manufactured using Upchurch Scientific extruder polymer tubing, you are assured of the concentricity of the resultant connection.

Plugs & Caps

P-316



U-467R



VHP-600



P-755



PLUGS & CAPS

PART NO	DESCRIPTION	PORT	HEAD STYLE	MATERIAL	QTY
PLUGS					
P-120	Plug	1/4-28 Coned	Standard Knurl	PCTFE Natural	ea
P-123	Plug	1/4-28 Flat-Btm	5/16" Hex	ETFE Natural	ea
P-309	Plug	1/4-28 Flat-Btm	Standard Knurl	Delrin® Black	ea
P-311	Plug	1/4-28 Flat-Btm	Standard Knurl	ETFE Natural	ea
P-314	Plug	M6 Flat-Btm	Standard Knurl	ETFE Black	ea
P-316	Plug	1/4-28 Flat-Btm	Standard Knurl	PFA Natural	ea
P-321	Plug, FlushNut™	1/4-28 Flat-Btm	FlushNut	PEEK Natural	ea
P-520	Plug	10-32 Coned	5/16" Hex	SST	ea
P-550	Plug, Extra Long	10-32 Coned	Standard Knurl	PEEK Natural	ea
P-551	Plug	10-32 Coned	Standard Knurl	PEEK Natural	ea
P-552	Plug	6-40 Coned	Headless Knurl	PEEK Natural/PCTFE	ea
P-555	Plug	6-32 Coned	Standard Micro Knurl	PEEK Natural	ea
P-556	Plug	5/16-24 Flat-Btm	Standard Knurl	PEEK Natural	ea
P-558	Plug	6-40 Flat-Btm	Micro Headless Knurl	PEEK Green	ea
P-559	Plug	6-32 Flat-Btm	Micro Headless Knurl	PEEK Natural	ea
P-849	Plug	10-32 Coned	Standard Knurl	Delrin® Black	ea
U-467R	Plug	10-32 Coned	Standard Knurl	Delrin® Red	ea
VHP-600	VHP Plug	10-32 Coned	3/8" Hex	PK-SST	ea
CAPS					
P-754	Cap	10-32 Coned	Standard Knurl	ETFE Yellow	ea
P-755	Cap	1/4-28 Flat-Btm	Standard Knurl	ETFE Black	ea
P-756	Cap	M6 Flat-Btm	Standard Knurl	ETFE Blue	ea

Tools

Wrenches

These tools can be used to tighten most of our knurled nuts in hard to reach places. For precise tightening the extender tools listed with 1/4" hex drives are designed to adapt to any torque wrench with a female 1/4" socket, such as the VHP-4000 Torque Driver. The tools featured on this page also include the FlushNut™ wrenches.

Wrenches

For your convenience, we offer wrenches in three standard sizes. You will need two A-304 wrenches to tighten most nuts into unions. The IDEX Wrench is slotted to fit over 1/16" and 1/8" OD tubing, and has 1/4" and 5/16" internal hex ends, to engage with the heads of the hex-head fittings most commonly used with Rheodyne® valves and the stainless steel fittings listed on page 226.

Removal Tool

Use the LT-300 Removal Tool to detach LiteTouch® and Super Flangeless™ Ferrules from tubing. Simply slide the appropriate tool blade slot between the lock ring and the ferrule body. With a slight twist, the ring will pop off, releasing the ferrule from the tubing.

Please Note: This Removal Tool will not work with the LT-135 Ferrule System.

P-297



P-298



P-299



P-399



A-304



LT-300



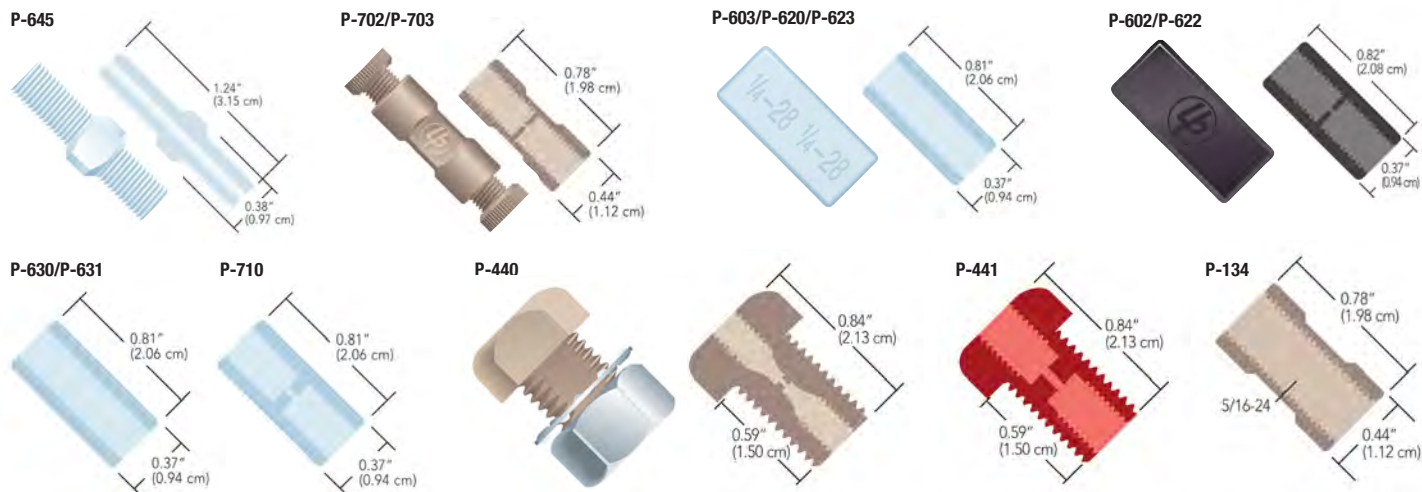
TECH TIP

The IDEX Wrench is slotted to fit over 1/16" and 1/8" OD tubing, and has 1/4" and 5/16" internal hex ends



TOOLS			
PART NO	DESCRIPTION	MATERIAL	QTY
EXTENDER TOOLS			
P-291	Extender Tool for Standard Head Nuts, with 1/4" Hex Drive	Aluminum	ea
P-298	Extender Tool for Standard Head Nuts	Delrin	ea
P-299	Extender Tool for Standard Head Nuts	Aluminum	ea
P-399	Extender Tool for Standard Head Nuts, Short	Aluminum	ea
P-297	Extender Tool for Headless Nuts	Aluminum	ea
P-292	Extender Tool for Headless Nuts, with 1/4" Hex Drive	Aluminum	ea
P-277	Extender Tool for Standard Micro Nuts	Aluminum	ea
N-290	Extender Tool for Micro Headless Nuts	Aluminum	ea
P-278	Extender Tool for Female Nuts, with 1/4" Hex Drive	Aluminum	ea
MISCELLANEOUS TOOLS			
A-304	Wrench, 1/4" x 5/16"	Steel	ea
A-305	Wrench, 1/2" x 9/16"	Steel	ea
A-320	Wrench, 3/8" x 7/16"	Steel	ea
6810	IDEX Wrench, 1/4" x 5/16"	Steel	ea
F-345	FlushNut Wrench for 10-32 Threaded Fittings	Steel/Plastic Handle	ea
F-346	FlushNut Wrench for 1/4-28 Threaded Fittings	Steel/Plastic Handle	ea
LT-300	Removal Tool for LiteTouch and Super Flangeless Ferrules	Steel/Plastic Handle	ea

Upchurch Scientific Low Pressure Unions



UPCHURCH SCIENTIFIC LOW PRESSURE UNIONS

PART NO	DESCRIPTION	TUBING OD	THREADS	THRU-HOLE	SWEPT VOL.	PRESSURE RATING	MATERIAL	COLOR	INCLUDES
PEEK UNION ASSEMBLIES									
P-702	Union	1/16"	1/4-28 Flat Btm	0.020" (0.50 mm)	0.41 µL	1,000 PSI (69 bar)	PEEK	Natural	(2) XP-235
P-703	Union	1/16"	1/4-28 Flat Btm	0.050" (1.25 mm)	2.57 µL	1,000 PSI (69 bar)	PEEK	Natural	(2) XP-335
P-615	Union	1/8"	1/4-28 Flat Btm	0.050" (1.25 mm)	0.80 µL	1,000 PSI (69 bar)	PEEK	Natural	(2) P-100
P-779	NanoTight Union		10-32	0.005" (1.25 mm)	8.0 µL	5,000 PSI (345 bar)	PEEK	Natural	(2) F-331N
ETFE UNION ASSEMBLIES									
P-630	True ZDV Union	1/16"	1/4-28 Flat Btm	N/A	N/A	1,000 PSI (69 bar)	ETFE	Natural	(2) P-200N/P-245
P-631	True ZDV Union	1/8"	1/4-28 Flat Btm	N/A	N/A	1,000 PSI (69 bar)	ETFE	Natural	(2) P-300N/P-345
P-710	Union	1/16"	1/4-28 Flat Btm	0.030" (0.75 mm)	0.93 µL	1,000 PSI (69 bar)	ETFE	Natural	(2) XP-245
STANDARD UNIONS									
P-603	True ZDV Std Union		1/4-28 Flat Btm	N/A	N/A	N/A	Delrin	Natural	N/A
P-620	True ZDV Std Union		1/4-28 Flat Btm	N/A	N/A	N/A	PP	Natural	N/A
P-623	True ZDV Std Union		1/4-28 Flat Btm	N/A	N/A	N/A	ETFE	Natural	N/A
METRIC UNIONS									
P-602	Metric Union		M6-Flat Btm	0.020" (0.50 mm)	0.41 µL	N/A	Delrin	Black	N/A
P-606	Metric Union, Female		M6-Flat Btm	0.060" (1.55 mm)	3.7 µL	N/A	Delrin	Black	N/A
P-622	Metric Union		M6-Flat Btm	0.020" (0.50 mm)	0.41 µL	N/A	ETFE	Blue	N/A
MALE UNION									
P-645	Male Union		1/4-28 Flat Btm	0.062" (1.60 mm)	61.3 µL	500 PSI (34 bar)	PCTFE	Natural	N/A
BULKHEAD UNIONS									
P-440	Union	—	10-32 Coned	0.020" (0.50 mm)	1.9 µL	1,000 PSI (69 bar)	PEEK	Natural	(1) SS Nut/Washer
P-441	Union	—	1/4-28 Flat Btm	0.040" (1.00 mm)	2.9 µL	1,000 PSI (69 bar)	PEEK	Red	(1) SS Nut/Washer
P-441N	Union	—	1/4-28 Flat Btm	0.040" (1.00 mm)	2.9 µL	1,000 PSI (69 bar)	PEEK	Natural	(1) SS Nut/Washer
P-442	Union	—	M6 Flat Btm	0.040" (1.00 mm)		1,000 PSI (69 bar)	PEEK	Black	(1) SS Nut/Washer
U-421	Union ZDV	—	10-32 Coned	0.050" (1.30 mm)		1,000 PSI (69 bar)	SS	—	(1) SS Nut/Washer
LARGE BORE UNION									
P-134	True ZDV Union	—	5/16-24 Flat Btm	N/A	N/A	1,000 PSI (69 bar)	PEEK	Natural	N/A - see pg 223
U-658	Union Assembly	1/4"	5/16 to 1/2-20 Flat Btm	0.188" (4.78 mm)	57 nL	1,000 PSI (69 bar)	PEEK	Black	N/A - see pg 223
ELBOW CONNECTORS									
P-430	Elbow	1/16"	1/4-28 Flat Btm	0.020" (0.50 mm)	1.4 µL	1,000 PSI (69 bar)	PEEK	Natural	(2) XP-235
P-432	Elbow	1/8"	1/4-28 Flat Btm	0.062" (1.60 mm)	13.6 µL	1,000 PSI (69 bar)	PEEK	Natural	(2) XP-335

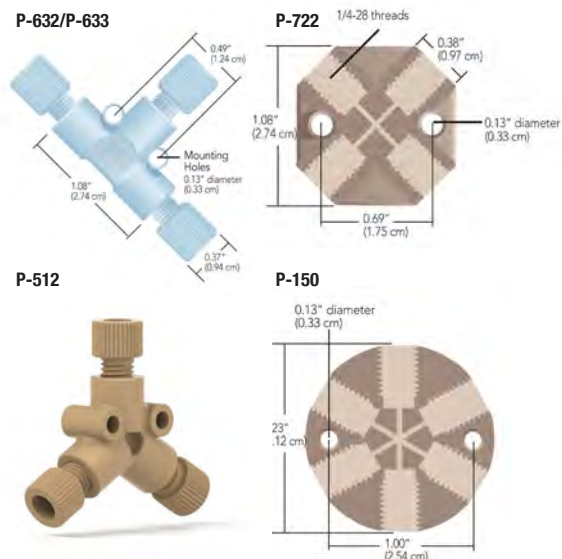
Upchurch Scientific Low Pressure Tees & Crosses

Tees, Crosses & Y Connectors

Upchurch Scientific® PEEK "Y" Connectors are designed to split a stream or join two streams together, just like a tee. However, the configuration of a tee can lead to turbulent flow and solvent outgassing, which increases baseline noise and reduces sensitivity. The geometry of a Y connector creates less turbulence and thus can improve analytical results.

Manifolds

- ➔ Multiport mixing chamber
- ➔ Gas sparging splitting union
- ➔ Sample injection onto multi-well plates or a multiple direction flow path union



UPCHURCH SCIENTIFIC LOW PRESSURE TEES & CROSSES

PART NO	DESCRIPTION	TUBING OD	THREADS	THRU-HOLE	SWEPT VOL.	PRESSURE RATING	MATERIALS	INCLUDES
P-632	Tee	1/16"	1/4-28 Flat Btm	0.020" (0.50)	2.9 µL	1,000 PSI (69 bar)	ETFE	(3) P-245, (3) P-200N
P-633	Tee	1/8"	1/4-28 Flat Btm	0.050" (1.25)	17.5 µL	500 PSI (34 bar)	ETFE	(3) P-345, (3) P-300N
P-634	Cross	1/16"	1/4-28 Flat Btm	0.020" (0.50)	3.8 µL	1,000 PSI (69 bar)	ETFE	(3) P-245, (3) P-200N
P-635	Cross	1/8"	1/4-28 Flat Btm	0.050" (1.25)	22.8 µL	500 PSI (34 bar)	ETFE	(3) P-345, (3) P-300N
P-712	Tee	1/16"	1/4-28 Flat Btm	0.020" (0.50)	2.9 µL	1,000 PSI (69 bar)	PEEK	(3) XP-235
P-713	Tee	1/8"	1/4-28 Flat Btm	0.050" (1.25)	17.5 µL	500 PSI (34 bar)	PEEK	(3) XP-335
P-714	Tee	1/16"	1/4-28 Flat Btm	0.040" (1.00)	11.4 µL	1,000 PSI (69 bar)	PEEK	(3) XP-235
P-722	Cross	1/16"	1/4-28 Flat Btm	0.020" (0.50)	3.8 µL	1,000 PSI (69 bar)	PEEK	(3) XP-235
P-723	Cross	1/8"	1/4-28 Flat Btm	0.050" (1.25)	22.8 µL	500 PSI (34 bar)	PEEK	(3) XP-335
P-800	Tee	1/8"	1/4-28 Flat Btm	0.050" (1.25)	17.5 µL	500 PSI (34 bar)	PEEK	(3) P-335

Y CONNECTORS

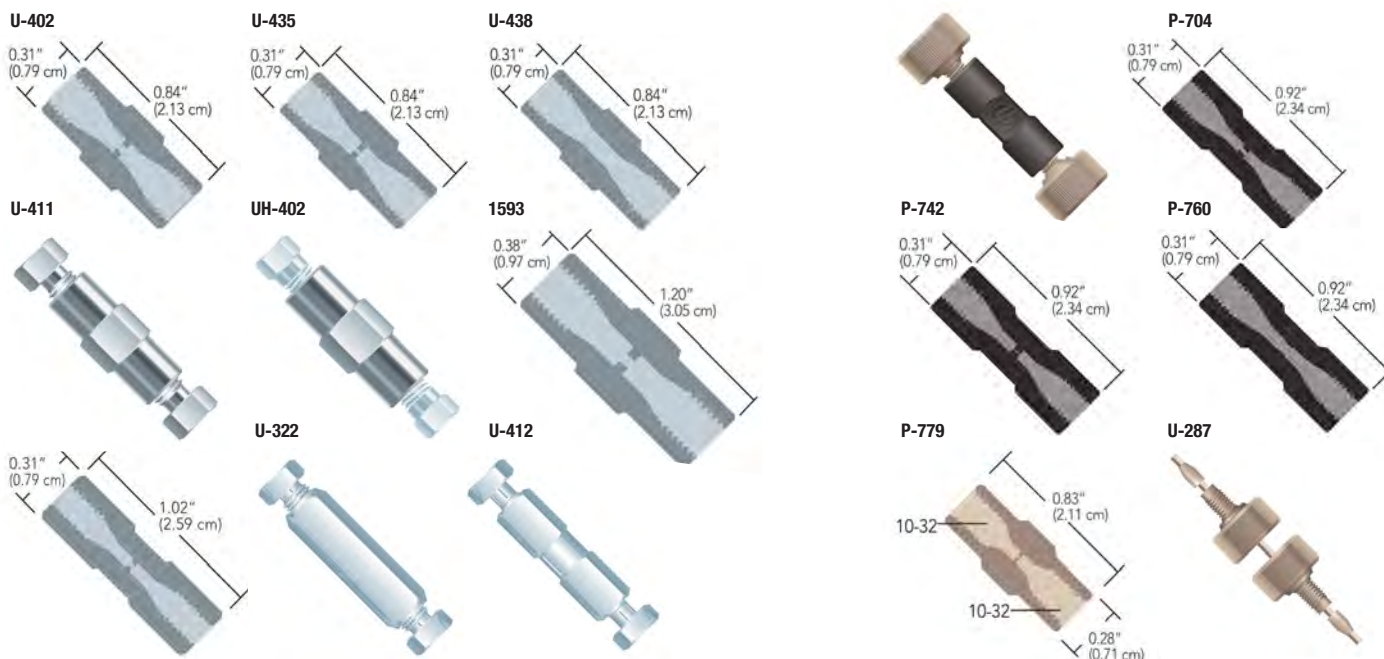
P-512	Y Connector	1/16" OD	1/4-28 Flat Btm	0.020" (0.50)	1.7 µL	1,000 PSI (69 bar)	PEEK	(3) XP-235
P-513	Y Connector	1/8" OD	1/4-28 Flat Btm	0.040" (1.00)	6.0 µL	500 PSI (34 bar)	PEEK	(3) XP-335
P-514	Y Connector	1/8" OD	1/4-28 Flat Btm	0.060" (1.50)	13.6 µL	500 PSI (34 bar)	PEEK	(3) XP-335
P-515	Y Connector	3/16" OD	5/16-24 Flat Btm	0.125" (3.20)	47.7 µL	500 PSI (34 bar)	PEEK	(3) XP-132

MANIFOLDS

P-150	7-Port Manifold	1/16" OD	1/4-28 Flat Btm	0.040" (1.00)	42.0 µL	1,000 PSI (69 bar)	PEEK	(7) P-255, (7) P-250
P-151	7-Port Manifold	1/8" OD	1/4-28 Flat Btm	0.062" (1.60)	83 µL	500 PSI (34 bar)	PEEK	(7) P-331, (7) P-250
P-152	6-Port Manifold	1/16" OD	1/4-28 Flat Btm	0.040" (1.00)	26.8 µL	1,000 PSI (69 bar)	PEEK	(6) P-255, (6) P-250
P-153	6-Port Manifold	1/8" OD	1/4-28 Flat Btm	0.062" (1.60)	62.3 µL	500 PSI (34 bar)	PEEK	(6) P-331, (6) P-359
P-154	5-Port Manifold	1/16" OD	1/4-28 Flat Btm	0.040" (1.00)	22.3 µL	1,000 PSI (69 bar)	PEEK	(5) P-255, (5) P-250
P-155	5-Port Manifold	1/8" OD	1/4-28 Flat Btm	0.062" (1.60)	53.8 µL	500 PSI (34 bar)	PEEK	(5) P-331, (5) P-359
P-170	7-Port Manifold	1/16" OD	10-32 Coned	0.020" (0.50)	2.2 µL	5,000 PSI (345 bar)	PEEK	(7) F-331
P-190	9-Port Manifold	1/8" OD	1/4-28 Flat Btm	0.062" (1.60)	160 µL	500 PSI (34 bar)	PEEK	(9) P-331, (9) P-359
P-191	9-Port Manifold	1/16" OD	1/4-28 Flat Btm	0.040" (1.00)	139 µL	1,000 PSI (69 bar)	PEEK	(9) P-255, (9) P-250

NOTE To order just the body of one of our tees and crosses without fittings, simply add a '-01' to the part number (P-632-01).

Upchurch Scientific Zero Dead Volume Unions



UPCHURCH SCIENTIFIC ZERO DEAD VOLUME UNIONS

PART NO	DESCRIPTION	TUBING OD	THREADS	THRU-HOLE	SWEPT VOL.	PRESSURE RATING	MATERIAL	INCLUDES
STAINLESS STEEL ZDV UNIONS								
1593	Union	1/8"	1/4-28 Coned	0.050" (1.25 mm)	1.48 µL	20,000 PSI (1,380 bar)	SS	(2) C-235/C-236
U-411	Union	1/16"	10-32 Coned	0.007" (0.178 mm)	13 nL	20,000 PSI (1,380 bar)	SS	(2) U-400/U-401
U-435	Union	1/16"	10-32 Coned	0.010" (0.25 mm)	20 nL	20,000 PSI (1,380 bar)	SS	(2) U-400/U-401
U-402	Union	1/16"	10-32 Coned	0.020" (0.50 mm)	0.13 µL	20,000 PSI (1,380 bar)	SS	(2) U-400/U-401
U-437	Union	1/16"	10-32 Coned	0.050" (1.25 mm)	0.84 nL	20,000 PSI (1,380 bar)	SS	(2) U-400/U-401
U-438	Union	1/16"	10-32 Coned	0.067" (1.70 mm)	Near 0 µL	20,000 PSI (1,380 bar)	SS	(2) U-400/U-401, (1) P-554 Gauge Plug
UH-402	VHP Union	1/16"	10-32 Coned	0.010" (0.25 mm)	20 nL	30,000 PSI (2,070 bar)	SS	(2) VHP-200
VICI (VALCO) COMPATIBLE STAINLESS STEEL ZDV UNION								
U-322	Union	1/16"	10-32 Coned	0.020" (0.50 mm)	0.15 µL	20,000 PSI (1,380 bar)	SS	(2) U-320/U-321
SSI COMPATIBLE STAINLESS STEEL ZDV UNION								
U-352	Union	1/16"	1/4-28 Coned	0.020" (0.50 mm)	0.10 µL	20,000 PSI (1,380 bar)	SS	(2) U-350
WATERS COMPATIBLE STAINLESS STEEL ZDV UNION								
U-412	Union	1/16"	10-32 Coned	0.020" (0.50 mm)	0.10 µL	20,000 PSI (1,380 bar)	SS	(2) U-410/U-401
PEEK ZDV UNIONS								
P-704	Union	1/16"	10-32 Coned	0.020" (0.50 mm)	0.28 µL	5,000 PSI (344 bar)	PEEK	(2) F-300
P-705	Union	1/16"	1/4-28 Coned	0.020" (0.50 mm)	0.21 µL	5,000 PSI (344 bar)	PEEK	(2) F-300
P-706	Union	1/16"	1/4-28 Coned	0.050" (1.25 mm)	1.2 µL	5,000 PSI (344 bar)	PEEK	(2) F-300
P-742	Union	1/16"	10-32 Coned	0.010" (0.25 mm)	0.07 µL	5,000 PSI (344 bar)	PEEK	(2) F-300
P-760	Union	1/16"	10-32 Coned	0.050" (1.25 mm)	1.2 µL	5,000 PSI (344 bar)	PEEK	(2) F-300
P-779	NanoTight™ Union	1/16" Tubing Sleeve	10-32 Coned	0.005" (0.125 mm)	8 nL	5,000 PSI (344 bar)	PEEK	(2) F-331
COLUMN COUPLERS								
U-287	Male Union	—	10-32 Coned	0.010" (0.25 mm)	3.6 µL	5,000 PSI (344 bar)	PEEK	(2) F-300
U-284	Male Union	—	10-32 Coned	0.007" (0.178 mm)	1.3 µL	5,000 PSI (344 bar)	SS/Delrin	(2) F-200
U-281	Precolumn Coupler	—	10-32 Coned	0.020" (0.50 mm)	6 µL	4,000 PSI (276 bar)	PCTFE	—

NanoTight™ Union connects 1/16" OD tubing to capillary tubing using tubing sleeves (found on page 233)

High Pressure Tees & Crosses

VHP Tees & Crosses

Upchurch Scientific® has developed a line of MicroTees and MicroCrosses, manufactured from stainless steel and featuring small thru-holes and very low internal volume. Additionally, the stainless steel construction allows these products to be used in applications where electrical conductivity is desired.

Stainless Steel Tees & Crosses

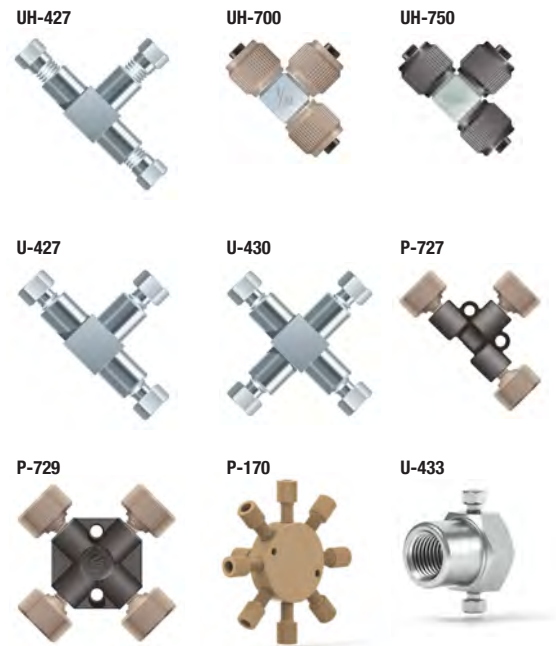
These 316 stainless steel connectors come complete with 10-32 stainless steel fittings for use with 1/16" OD tubing.

PEEK Tees & Crosses

Our PEEK Tees and Crosses are precisely designed to withstand environmental stresses in the high pressure regions of a system. Several researchers use our PEEK MicroTee to introduce fluid to their stream just prior to a Mass Spectrometer because of its advantageous internal geometry and PEEK polymer's electrical resistance.

Pressure Gauge and Pressure Gauge Tee

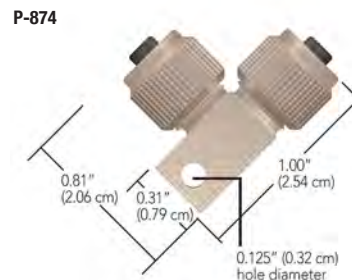
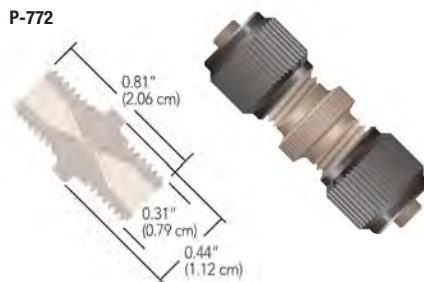
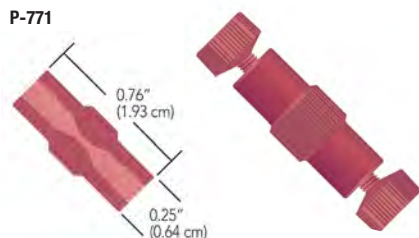
You may find it necessary to monitor the pressure somewhere in-line along your 1/16" OD tubing. The Upchurch U-433 Pressure Gauge Tee will allow you to do so. Simply cut your tubing and connect each side to the tee with the 10-32 coned fittings supplied.



HIGH PRESSURE TEES & CROSSES							
PART NO	DESCRIPTION	TUBING OD	THREADS	THRU-HOLE	SWEPT VOL.	PRESSURE RATING	INCLUDES
VHP TEES & CROSSES							
UH-427	VHP Tee, SST	1/16" OD	10-32 Coned	0.020" (0.50)	57 nL	30,000 PSI (2,070 bar)	(3) VHP-200
UH-700	VHP MicroTee, PEEK/SST	1/32" OD	5/16-24 Coned	0.010" (0.25)	84 nL	15,000 PSI (1,034 bar)	(3) PK-112, (3) P-416
UH-750	VHP MicroTee, PEEK/SST	360 µm	5/16-24 Coned	0.010" (0.25)	84 nL	15,000 PSI (1,034 bar)	(3) PK-152, (3) P-416BLK
UH-752	VHP MicroCross, PEEK/SST	360 µm	5/16-24 Coned	0.010" (0.25)	101 nL	15,000 PSI (1,034 bar)	(4) PK-152, (4) P-416BLK
STAINLESS STEEL TEES & CROSSES							
U-428	Tee	1/16"	10-32 Coned	0.020" (0.50)	0.57 µL	20,000 PSI (1,380 bar)	(3) U-400, (3) U-401
U-429	Tee	1/16"	10-32 Coned	0.040" (1.00)	2.1 µL	20,000 PSI (1,380 bar)	(3) U-400, (3) U-401
U-430	Cross	1/16"	10-32 Coned	0.020" (0.50)	0.72 µL	20,000 PSI (1,380 bar)	(4) U-400, (4) U-401
U-431	Cross	1/16"	10-32 Coned	0.040" (1.00)	2.5 µL	20,000 PSI (1,380 bar)	(4) U-400, (4) U-401
PEEK TEES & CROSSES							
P-715	Tee	1/16"	1/4-28 Coned	0.020" (0.50)	2.9 µL	5,000 PSI (345 bar)	(3) F-301
P-716	Tee	1/16"	1/4-28 Coned	0.050" (1.25)	17.5 µL	5,000 PSI (345 bar)	(3) F-301
P-726	Cross	1/16"	1/4-28 Coned	0.050" (1.25)	3.53 µL	3,500 PSI (241 bar)	(4) F-301
P-727	Tee	1/16"	10-32 Coned	0.020" (0.50)	0.57 µL	3,500 PSI (241 bar)	(3) F-300
P-728	Tee	1/16"	10-32 Coned	0.050" (1.25)	3.0 µL	3,500 PSI (241 bar)	(3) F-300
P-729	Cross	1/16"	10-32 Coned	0.020" (0.50)	0.72 µL	3,500 PSI (241 bar)	(4) F-300
P-730	Cross	1/16"	10-32 Coned	0.050" (1.25)	22.8 µL	3,500 PSI (241 bar)	(4) F-300
P-170	7-Port Manifold	1/16"	10-32 Coned	0.020" (0.50)	2.2 µL	5,000 PSI (345 bar)	(7) F-331
STAINLESS STEEL PRESSURE GAUGE TEE							
U-433	Pressure Gauge Tee	1/16"	10-32 – 1/4 NPT	N/A	N/A	N/A	(2) U-400, (2) U-401
PG-300T	300 PSI Pressure Gauge & U-433 Tee	1/16"	10-32 – 1/4 NPT	N/A	N/A	N/A	(2) U-400, (2) U-401
PG-1000T	1,000 PSI Pressure Gauge & U-433 Tee	1/16"	10-32 – 1/4 NPT	N/A	N/A	N/A	(2) U-400, (2) U-401
PG-6000T	6,000 PSI Pressure Gauge & U-433 Tee	1/16"	10-32 – 1/4 NPT	N/A	N/A	N/A	(2) U-400, (2) U-401

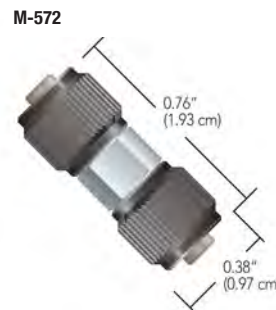
MicroTight® Connectors for Capillary Tubing

Connect two pieces of capillary tubing with these Upchurch Scientific® PEEK MicroTight Connectors. The True ZDV Unions allow two pieces of tubing to connect directly to each other—using the included gauge plug to ensure proper alignment. The standard union and elbow both feature a 0.006" (0.150 mm) thru-hole, adding only a small amount of additional flow-path volume to help ensure proper chromatographic results.



Conductive MicroTight Union

The Upchurch Scientific® MicroTight Union manufactured by IDEX Health & Science provides an excellent opportunity to introduce voltage into an electrospray or capillary electrophoresis system. With an extremely low internal volume of 16 nL, this union can be placed inline with 360 µm OD capillary tubing. Mount and apply voltage to these unions using the Insulating Mounting Bracket below.



Insulating Mounting Bracket

The Insulating Mounting Bracket easily integrates the Conductive MicroTight Union or the Conductive Mini MicroFilters into your system or lab. The product snaps into place. Voltage from your lead wire is conducted through the attaching stainless steel nut and screw (included), then onto the mounted product via the stainless steel clip.

The bracket's base includes two holes (#2 screw, clearance) for easy mounting onto any lab surface. Dimensions are 1.25" L x 0.45" W x 0.63" H.

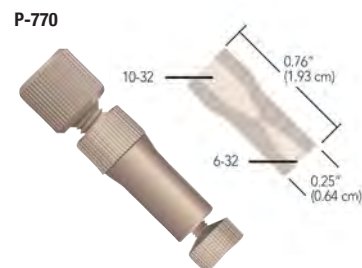
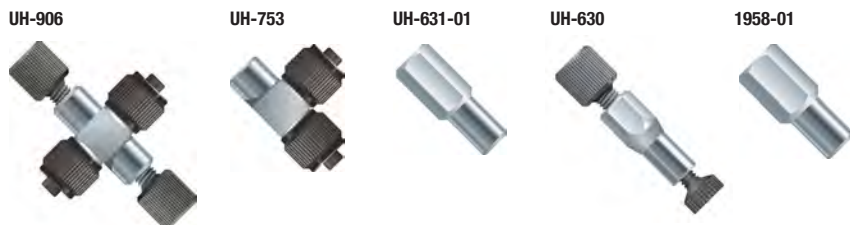


MICROTIGHT CONNECTORS FOR CAPILLARY TUBING								
PART NO	DESCRIPTION	THREADS	THRU-HOLE	SWEPT VOL.	PRESSURE RATING	MATERIAL	INCLUDES	
MICROTIGHT UNIONS								
P-720	True ZDV Union for MicroTight Sleeves	6-32 Coned	N/A	N/A	4,000 PSI (276 bar)	PEEK	(2) F-125, (1) P-553	
P-771	True ZDV Union for 1/32" OD	6-32 Coned	N/A	N/A	5,000 PSI (345 bar)	PEEK	(2) F-126S, (1) P-553	
P-772	Union for 360 µm OD	5/16-24 Coned	0.006" (0.150 mm)	5 nL	5,000 PSI (345 bar)	PEEK	(2) F-152, (2) P-416BLK	
P-874	MicroElbow for MicroTight Sleeves	5/16-24 Coned	0.006" (0.150 mm)	20 nL	4,000 PSI (276 bar)	PEEK	(2) F-172, (2) P-416	
REPLACEMENT GAUGE PLUGS (TO ACHIEVE TRUE ZDV CONNECTIONS WITH P-720 AND P-771 UNIONS)								
P-553	Gauge Plug	6/32 Coned	N/A	N/A	N/A	Delrin®	N/A	
UNIONS								
M-572	Conductive Union for 360 µm OD	5/16-24 Coned	0.011" (0.279 mm)	16 nL	5,000 PSI (345 bar)	PEEK/SS	(2) F-152, (2) P-416BLK, (1) M-128NF	
INSULATING MOUNTING BRACKET								
M-447	Insulating Mounting Bracket	N/A	N/A	N/A	N/A		N/A	

MicroTight® Adapters

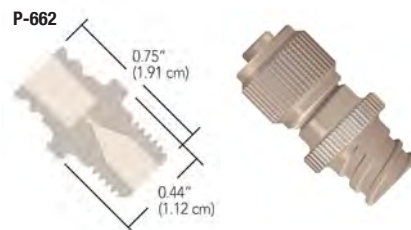
Create a true zero dead volume (ZDV) connection between 1/16" OD tubing and capillary tubing with these MicroTight Adapters.

For very High Pressure applications the UH-630 will connect 1/16" OD to 1/32" OD tubing in an inline true ZDV connection with the ability to withstand 12,000 PSI (828 bar). The materials of construction also allow this product to be used up to 200 °C, which reduces the pressure rating to 8,000 PSI (552 bar).



Luer-To-MicroTight® Adapter

The Upchurch Scientific Luer-to-MicroTight Adapter is ideal for infusing sample into lab-on-a-chip devices. This product is made entirely of biocompatible PEEK polymer and introduces only 14 nL of additional volume to the flow path. Use it to directly connect a luer-tip syringe or other product that terminates with a standard male luer to 360 µm OD capillary tubing without tubing sleeves. MicroTight Fittings are included.



NOTE

While many 10-32 coned fittings are interchangeable, coned fittings using different threads are generally not interchangeable. IDEX Health & Science recommends that only the style of coned fittings that accompanies these connectors be used for replacements.

MICROTIGHT & LUER-TO-MICROTIGHT ADAPTERS

PART NO	DESCRIPTION	TUBING OD	THREADS	THREADS	SWEPT VOL.	PRESSURE	MATERIAL	COLOR	INCLUDES
MICROTIGHT ADAPTERS									
P-770	True ZDV, Tubing to MicroTight Tubing Sleeve	1/16"	10-32 C	6-32 C	N/A	4,000 PSI	PEEK	Natural	(1) F-120/F-125/P-554
P-881	True ZDV	1/16" – 1/32"	10-32 C	6-32 C	N/A	5,000 PSI	PEEK	Red	(1) F-120R/F-126S/P-554
P-882	True ZDV	1/16" – 360 µm	10-32 C	6-32 C	N/A	5,000 PSI	PEEK	Blue	(1) F-120B/F-124S/P-554
UH-630	VHP	1/16" – 1/32"	10-32 C	6-32 C	N/A	12,000 PSI	SS	SS/Black	(1) PK-120BLK/PK-126/P-554
UH-634	VHP	1/16" – 360 µm	10-32 C	6-32 C	N/A	12,000 PSI	SS	SS/Black	(1) PK-120BLK/PK-124/P-554
UH-753	VHP Tee	1/16" – 360 µm	10-32 C	5/16-24 C	152 nL	15,000 PSI*	SS	SS/Black	(2) P-416BLK/PK-152
1958-01	VHP	1/16" – 1/32"	10-32 C	M4x0.7 C	16 nL	30,000 PSI*	SS	SS	N/A
UH-631-01	VHP	1/16" – 1/32"	10-32 C	6-40 C	13 nL	30,000 PSI*	SS	SS	N/A
UH-906	Cross	1/16" – 360 µm	10-32 C	5/16-24 C	110 nL	15,000 PSI*	SS	SS/Black	(2) PK-120BLK/P-416BLK/PK-152

LUER-TO-MICROTIGHT ADAPTER

P-662	Luer-to-MicroTight Adapter	360 µm	Luer	5/16-24 C	14 nL	45 PSI	PEEK	Natural	(1) F-152, (1) P-416
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REPLACEMENT GAUGE PLUGS (TO ACHIEVE TRUE ZDV CONNECTIONS WITH THE ABOVE ADAPTERS)

P-554	Gauge Plug		10-32 C		N/A	N/A	Delrin®	White	N/A
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C = Coned *Pressure rating depends upon the fitting used

MicroTee & Cross for Capillary Tubing

- Direct connect 1/16", 1/32", 360 µm OD tubing, plus other capillary tubing
- Low swept volume

Use MicroTees and MicroCrosses to join capillary tubing. All of these products are made entirely of PEEK and have 0.006" (0.150 mm) thru-holes, with resulting swept volumes ranging from 29 to 81 nL.

NOTE

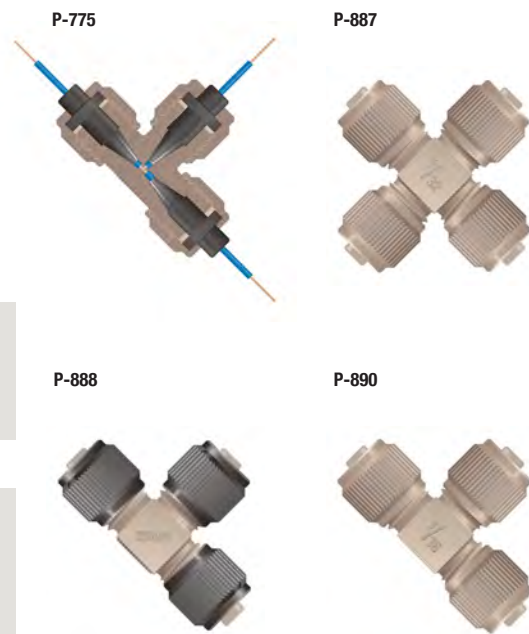
Use only the ferrules supplied with each connector—they are not interchangeable.

APP NOTE

Several researchers use our PEEK MicroTee to introduce ionizing voltage to their fluid stream just prior to a Mass Spectrometer. MicroTees are well suited for this application due to advantageous internal geometry and PEEK polymer's electrical resistance. The materials required for this setup are as follows: one gold or platinum conducting wire, one P-775 or P-875 MicroTee, one MicroTight Tubing Sleeve for the conducting wire (as needed to accommodate wire diameter), and at least two more MicroTight Tubing Sleeves to connect your capillary tubing.

To set up a similar connection, first thread your wire through the appropriate tubing sleeve, if necessary, with the wire extending beyond both ends of the sleeve. Slip the female nut included with the MicroTee over the wire or sleeved wire, followed by the ferrule—ensuring the wire (and its sleeve) extends well past the end of the ferrule tip. Align the tip of the wire with the thru-hole of the MicroTee and gently insert the wire until it bottoms out. Now finger tighten the female nut into place. Attach your flow path tubing to the MicroTee's two other available ports, following the instructions provided with the Micro Tee.

Begin fluid flow through the tee and apply voltage to the conducting wire lead. This setup typically provides effective electrospray ionization in applications having a flow rate of 100 µL/min or greater.



PEEK MICROTees & CROSS							
PART NO	DESCRIPTION	TUBING OD	THREADS	THRU-HOLE	SWEPT VOL.	PRESSURE RATING	INCLUDES
P-775	MicroTee	1/16"	5/16-24 Coned	0.006" (0.15 mm)	29 nL	4,000 PSI (276 bar)	(3) F-172, (3) P-416
P-777	MicroCross	1/16"	5/16-24 Coned	0.006" (0.15 mm)	39 nL	4,000 PSI (276 bar)	(4) F-172, (4) P-416
P-875	MicroTee with Mounting Hole, for MicroTight Sleeves		5/16-24 Coned	0.006" (0.15 mm)	29 nL	4,000 PSI (276 bar)	(3) F-172, (3) P-416
P-885	MicroTee	1/32"	5/16-24 Coned	0.006" (0.15 mm)	29 nL	5,000 PSI (345 bar)	(3) F-112, (3) P-416
P-887	MicroCross	1/32"	5/16-24 Coned	0.006" (0.15 mm)	38 nL	5,000 PSI (345 bar)	(4) F-112, (4) P-416
P-888	MicroTee	360 µm	5/16-24 Coned	0.006" (0.15 mm)	29 nL	5,000 PSI (345 bar)	(3) F-152, (3) P-416BLK
P-889	MicroCross	360 µm	5/16-24 Coned	0.006" (0.15 mm)	38 nL	5,000 PSI (345 bar)	(4) F-152, (4) P-416BLK
P-890	MicroTee	1/16"	5/16-24 Coned	0.006" (0.15 mm)	58 nL	5,000 PSI (345 bar)	(3) F-132, (3) P-416
P-891	MicroCross	1/16"	5/16-24 Coned	0.006" (0.15 mm)	81 nL	5,000 PSI (345 bar)	(4) F-132, (4) P-416

NanoPort Assemblies

- For lab-on-a-chip applications
- Wetted materials: PEEK and perfluoroelastomer

Upchurch Scientific® NanoPort Assemblies provide consistent fluid connections for chip-based analyses. Once attached, NanoPort connections can withstand pressure to 500 PSI (34 bar). NanoPorts will adhere to silicon, quartz, glass and some polymers.

All NanoPort components are made of inert, biocompatible PEEK polymer (nuts and ports) and Perlast® perfluoroelastomer (ferrules and gaskets). Their unique design also prevents adhesive contamination of the fluid path. Also, NanoPort connections add no additional volume to the fluid path, virtually eliminating dead volume traditionally associated with chip-based fluid connections.

10-32 NANOPORT ASSEMBLIES

PART NO	NUT	FERRULE	FOR CHIP HOLE (dia. x depth)	FOR TUBING OD
N-333	F-333N	F-142N	Up to 0.063" (1.6 mm)	1/16"

NanoPort Replacement Parts

NANOPORT REPLACEMENT PARTS

PART NO	DESCRIPTION	TUBING OD	THREADS	FOR CHIP HOLE
FITTINGS				
F-333N	Headless Fitting	1/16"	10-32 Coned	Up to 0.063" (1.6 mm)
F-142N	Ferrules	1/16"	10-32 Coned	Up to 0.063" (1.6 mm)
GASKETS				
N-123-02	Gasket	N/A	N/A	N/A



NOTE

To select the appropriate NanoPort assembly you will need to consider:

- Size of tubing you are connecting
- Dimensions of the chip hole
- Fitting style (one-piece or two-piece fittings)
- Nut head style (standard or headless nut)

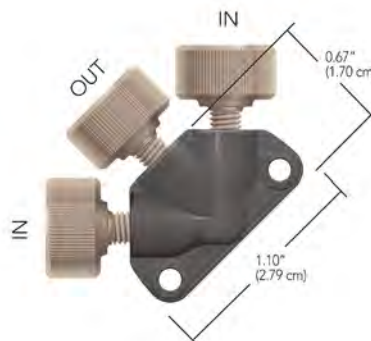
Please Note: Each NanoPort Assembly includes a fitting (one- or two-piece) a NanoPort, gasket, a 2-pack of preformed adhesive rings, and a clamp for holding the port in place while the adhesive cures.

Static Mixing Tees

- PEEK body with two-piece fingertight fittings
- Low swept volume

Upchurch Scientific® Static Mixing Tees are ideal for microbore or analytical gradient HPLC. They have a low swept volume of 2.2 µL (includes frit volume) and are designed for flow rates of 0.5 to 3 mL/min and a maximum pressure of 5,000 PSI (345 bar). The back pressure caused by the tee is typically only 10 to 20 PSI (0.7 to 1.4 bar) at these flow rates. The thru-holes are 0.020" (0.50 mm) and the center port features a 10 µm UHMWPE or stainless steel frit that aids mixing.

U-466 and U-466S

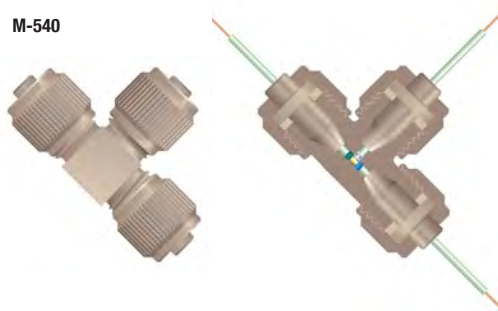


Micro Static Mixing Tee

- Constructed of inert PEEK and PCTFE
- Low swept volume of 0.95 µL
- Designed for flow rates of 20 – 250 µL/min

The Micro Static Mixing Tee utilizes a specifically engineered internal geometry to efficiently mix two fluid streams into one combined stream. The center port also features a 0.5 µm porosity PEEK polymer frit to aid in mixing. This frit adds a maximum of 20 PSI (1.4 bar) back pressure to most systems (within the stated flow rate range). The Mixing Tee handles a maximum pressure of 5,000 PSI (345 bar) when directly connecting 1/16" OD tubing, or up to 4,000 PSI (276 bar) with capillary tubing when using NanoTight™ Fittings and Tubing Sleeves.

M-540



NOTE

Turbulent mixing of solvents often increases outgassing. To maintain a bubble-free fluid pathway; we recommend solvent degassing when using this product.

The frit incorporated into our U-466 and U-466S Static Mixing Tees is not replaceable. If it becomes clogged, the Mixing Tee must be replaced.

STATIC & MICRO STATIC MIXING TEES

PART NO	DESCRIPTION	TUBING OD	THREADS	THRU-HOLE	SWEPT VOL.	PRESSURE RATING	INCLUDES
PEEK STATIC MIXING TEE							
U-466	Tee, 10 µm UHMWPE Frit	1/16"	10-32 Coned	0.020" (0.50 mm)	2.2 µL	5,000 PSI (345 bar)	(3) F-300
U-466S	Tee, 10 µm SS Frit	1/16"	10-32 Coned	0.020" (0.50 mm)	2.2 µL	5,000 PSI (345 bar)	(3) F-300
PEEK MICRO STATIC MIXING TEE							
M-540	Micro Static Mixing Tee	1/16"	5/16-24 Coned	0.010" (0.250 mm)	0.95 µL	5,000 PSI (345 bar)	(3) F-132/P-416
M-540A	Micro Static Mixing Tee, no Frit	1/16"	5/16-24 Coned	0.020" (0.50 mm)	2.2 µL	5,000 PSI (345 bar)	(3) F-132/P-416

ASI Static Mixers

- ➔ Interchangeable mixer cartridges
- ➔ Optimize mixing volume—improve gradient profile
- ➔ Available for in-line, binary and ternary formats (SS or PEEK)
- ➔ Increased reaction efficiency for post column derivatization

ASI manufactures a wide range of static mixers to solve the most demanding high pressure mixing problems. ASI HyperShear Mixers incorporate a highly efficient cross-flow shearing mechanism which produces vortex shear mixing over a wide flow range. This mixing technology typically delivers between 25% to 200% better mixing efficiency compared to conventional packed bed or tortuous path mixers.

Within a given mixer flow series, mixer cartridges are interchangeable. The ability to swap mixer cartridges within a given mixer series makes selecting the optimum mixer volume easy and economical. This is not the case with UHPLC mixers. Since we warranty the pressure rating of 15,000 PSI on the factory tested mixer assembly (housing and cartridge), UHPLC mixers are only sold as complete mixer assemblies.

ASI STATIC MIXERS					
COMPLETE ASSEMBLY			MIXER CARTRIDGE VOLUME (µL)	RECOMMENDED FLOW RATES (µL/min)	REPL. CART.
INLINE	BINARY TEE	TERNARY TEE			
SS MICRO FLOW SERIES COMPLETE ASSEMBLIES (CARTRIDGE & HOUSINGS)					
401-0005	402-0005	403-0005	5	0 – 5	400-0005
401-0010	402-0010	403-0010	10	5 – 10	400-0010
401-0025	402-0025	403-0025	25	10 – 20	400-0025
PEEK MICRO FLOW SERIES COMPLETE ASSEMBLIES (CARTRIDGE & HOUSINGS)					
401-0005B	402-0005B	403-0005B	5	0 – 5	400-0005B
401-0010B	402-0010B	403-0010B	10	5 – 10	400-0010B
401-0025B	402-0025B	403-0025B	25	10 – 20	400-0025B
SS LOW FLOW SERIES COMPLETE ASSEMBLIES (CARTRIDGE & HOUSINGS)					
411-0050	412-0050	413-0050	50	20 – 150	410-0050
—	★ 412-0100	—	100	100 – 250	410-0100
411-0150	412-0150	413-0150	150	150 – 500	410-0150
411-0250	412-0250	413-0250	250	500+	410-0250
PEEK LOW FLOW SERIES COMPLETE ASSEMBLIES (CARTRIDGE & HOUSINGS)					
411-0050B	412-0050B	413-0050B	50	20 – 150	410-0050B
—	★ 412-0100B	—	100	100 – 250	410-0100B
411-0150B	412-0150B	413-0150B	150	150 – 500	410-0150B
411-0250B	412-0250B	413-0250B	250	500+	410-0250B
SS UHPLC SERIES COMPLETE ASSEMBLIES (SOLD AS COMPLETE ASSEMBLY ONLY)					
401-0005HP	402-0005HP	403-0005HP	5	0 – 5	—
401-0010HP	402-0010HP	403-0010HP	10	5 – 10	—
401-0025HP	402-0025HP	403-0025HP	25	10 – 20	—
411-0050HP	412-0050HP	413-0050HP	50	20 – 150	—
411-0150HP	412-0150HP	413-0150HP	150	150 – 500	—
411-0250HP	412-0250HP	413-0250HP	250	500+	—

Other configurations are available, please contact Chrom Tech for more information.

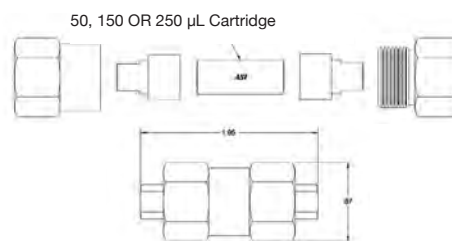
★ TOP SELLER!



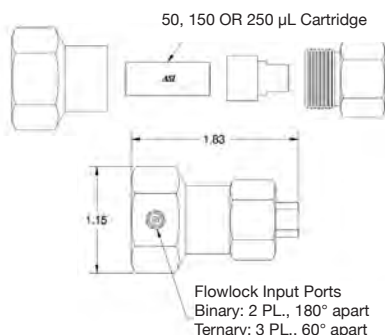
Female Ports are 10-32 Coned, designed to accept 1/16" OD tubing

Standard Assemblies are rated to 5,000 PSI
UHPLC Assemblies are rated to 15,000 PSI

In-Line Assemblies



Binary/Ternary Assemblies

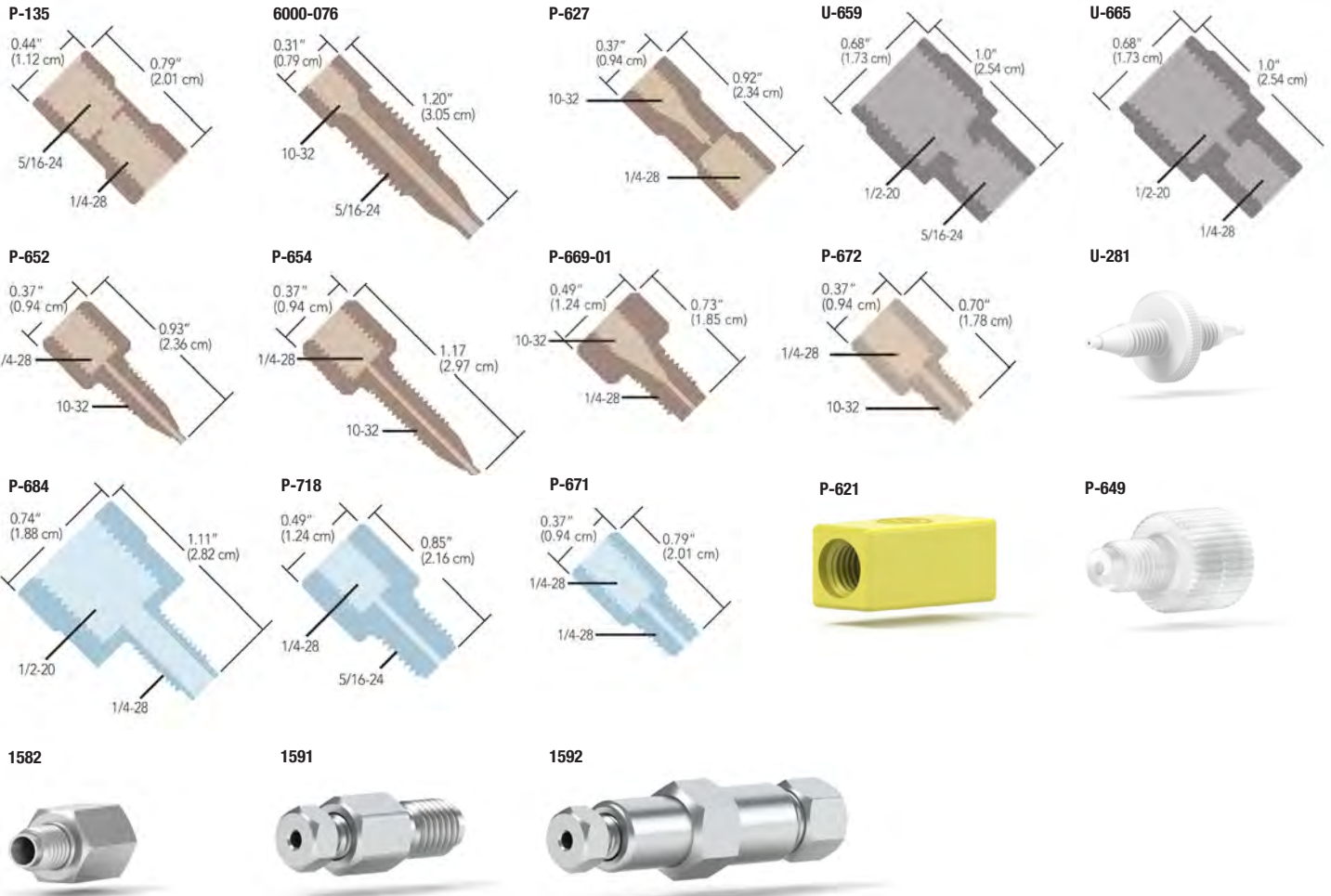


TECH TIP

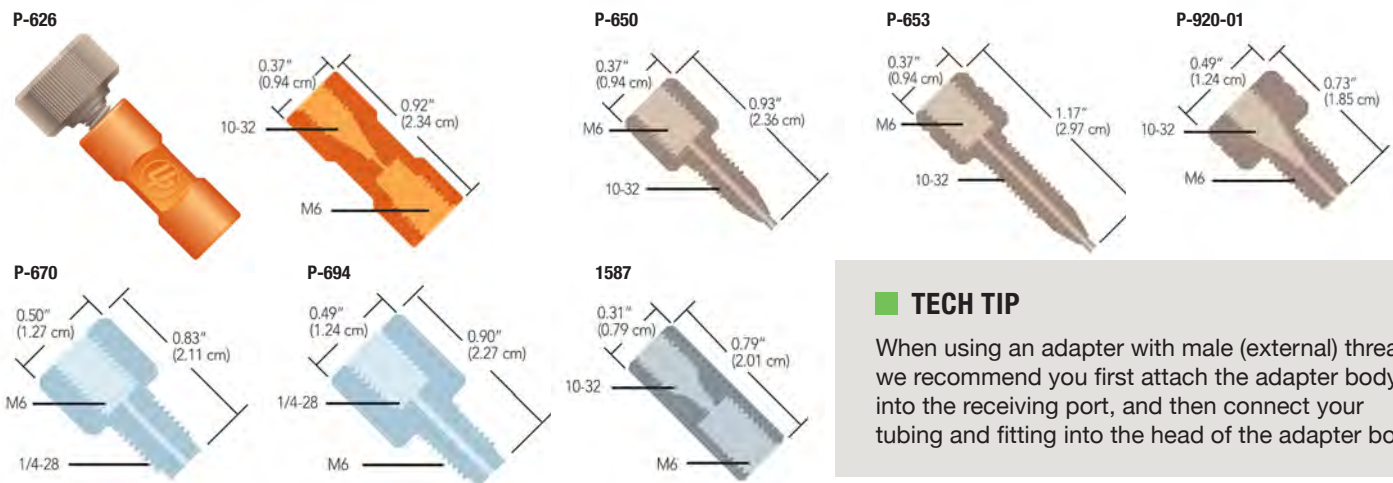
Choosing the right size mixer is a trade off between delay volume, mixing noise, gradient fidelity and chromatographic performance.

- ➔ For any given flow rate, the more the mixing volume the better the mixing, and the lower the baseline noise.
- ➔ The smaller the mixing volume, the better the definition and sharpness of linear gradients.
- ➔ Multi-pump high pressure gradient systems typically require far less mixing volume than low pressure single pump systems when running linear gradients.
- ➔ An ASI 150 µL in-line static mixer can be added in addition to the standard onboard mixer to further reduce mixing noise.

English Threaded Adapters



Metric Threaded Adapters



TECH TIP

When using an adapter with male (external) threads, we recommend you first attach the adapter body into the receiving port, and then connect your tubing and fitting into the head of the adapter body.

ENGLISH THREADED ADAPTERS						
PART NO	THREADS	THREADS	THRU-HOLE	SWEPT VOL.	PRESSURE RATING	INCLUDES
PEEK ADAPTERS						
6000-076	5/16-24 Coned, Male	10-32 Coned, Female	0.066" (1.70)	49.8 µL	3,000 PSI (207 bar)	N/A
P-135	5/16-24 Flat Btm, Female	1/4-28 Female	0.080" (2.05)	4.1 µL	1,000 PSI (69 bar)	N/A
P-627	10-32 Coned, Female	1/4-28 Flat Btm, Female	0.020" (0.50)	0.30 µL	1,000 PSI (69 bar)	(1) F-300
P-636	10-32 Coned, Male	10-32 Flat Btm, Female	0.030" (0.75)	6.1 µL	1,000 PSI (69 bar)	N/A
P-651	M6 Flat Btm, Male, Waters Comp.	10-32 Coned, Male	0.030" (0.75)	6.7 µL	1,000 PSI (69 bar)	N/A
P-652	1/4-28 Flat Btm, Female	10-32 Coned, Male	0.030" (0.75)	6.7 µL	1,000 PSI (69 bar)	N/A
P-654	1/4-28 Flat Btm, Female, XL	10-32 Coned, Male	0.030" (0.75)	9.5 µL	1,000 PSI (69 bar)	N/A
P-669-01	10-32 Coned, Female	1/4-28 Flat Btm, Male	0.040" (1.00)	6.6 µL	1,000 PSI (69 bar)	N/A
P-672	1/4-28 Flat Btm, Female	10-32 Flat Btm, Male	0.050" (1.25)	11.4 µL	1,000 PSI (69 bar)	N/A
U-659	5/16-24 Flat Btm, Female	1/2-20 Flat Btm, Female	Tapered ¹	42.0 µL	250 PSI (17 bar)	(1) XU-655
U-665	1/2-20 Flat Btm, Female	1/4-28 Flat Btm, Female	0.063" (1.60)	6.6 µL	250 PSI (17 bar)	(1) XU-655
PCTFE ADAPTERS						
P-640	10-32 Flat Btm, Female	1/4-28 Coned, Male	0.040" (1.00)	8 µL	1,000 PSI (69 bar)	(1) F-200
U-281	10-32 Coned, Male	10-32 Coned, Male	0.020" (0.50)	6.0 µL	4,000 PSI (345 bar)	N/A
P-674	5/16-24 Female	1/4-28 Flat Btm, Male	0.040" (1.00)	8.6 µL	1,000 PSI (69 bar)	N/A
P-681	5/16-24 Flat Btm, Female	1/4-28 Flat Btm, Male	0.125" (3.20)	96.6 µL	1,000 PSI (69 bar)	N/A
P-684	1/2-20 Flat Btm, Female	1/4-28 Flat Btm, Male	0.130" (3.30)	121.7 µL	250 PSI (17 bar)	N/A
P-718	5/16-24 Flat Btm, Male	1/4-28 Flat Btm, Male	0.040" (1.00)	10.3 µL	1,000 PSI (69 bar)	N/A
P-724	M6 Female	1/4-28 Flat Btm, Male	0.040" (1.00)	10.3 µL	1,000 PSI (69 bar)	N/A
PTFE ADAPTERS						
P-671	1/4-28 Flat Btm, Female	1/4-28 Flat Btm, Male	0.040" (1.00)	8 µL	1,000 PSI (69 bar)	N/A
P-693	1/4-28 Flat Btm, Female, Long	1/4-28 Flat Btm, Male	0.040" (1.00)	16.27 µL	1,000 PSI (69 bar)	N/A
ETFE ADAPTERS						
P-621	1/4-28 Flat Btm, Female	M6 Flat Btm, Female	N/A	N/A	1,000 PSI (69 bar)	N/A
P-649	1/4-28 Flat Btm, Male	5/16-24 Flat Btm, Female	0.063" (1.60)	24.5 µL	1,000 PSI (69 bar)	N/A
STAINLESS STEEL ADAPTERS						
1582	1/4-28 Flat Btm, Female	10-32 Coned, Male	0.040" (1.00)	11.4 µL	N/A ²	N/A
1583	10-32 Coned, Female	1/4-28 Flat Btm, Female	0.040" (1.00)	0.60 µL	N/A ²	(1) U-400/U-401
1586	10-32 Coned, Male	1/4-28 Flat Btm, Male	0.040" (1.00)	16.6 µL	N/A ²	N/A
1591	10-32 Coned, Female	1/4-28 Flat Btm, Male	0.040" (1.00)	6 µL	N/A ²	(1) U-400/U-401
1592	10-32 Female	1/4-28 Female	0.040" (1.00)	4 µL	20,000 PSI	(1) U-400/U-401

1) Thru-hole tapers from 0.188" (4.80) to 0.125" (3.20). 2) The pressure ratings of these adapters exceed the pressure holding ability of the fittings and tubing used with them.

METRIC THREADED ADAPTERS						
PART NO	THREADS	THREADS	THRU-HOLE	SWEPT VOL.	PRESSURE RATING	INCLUDES
PEEK ADAPTERS						
P-616	M6 Coned, Female	1/4-28 Coned, Female	0.020" (0.50)	0.34 µL	N/A*	(1) F-300
P-626	10-32 Coned, Female	M6 Flat Btm, Female	0.020" (0.50)	0.3 µL	1,000 PSI (69 bar)	(1) F-300
P-650	M6 Flat Btm, Female, Standard	10-32 Coned, Male	0.030" (0.75)	6.7 µL	1,000 PSI (69 bar)	N/A
P-653	M6 Flat Btm, Female, Extra Long	10-32 Coned, Male	0.030" (0.75)	6.7 µL	1,000 PSI (69 bar)	N/A
P-920-01	10-32 Coned, Female	M6 Flat Btm, Male	0.040" (1.00)	8.0 µL	1,000 PSI (69 bar)	N/A
PCTFE ADAPTERS						
P-670	M6 Flat Btm, Female	1/4-28 Flat Btm, Male	0.030" (0.75)	2.6 µL	1,000 PSI (69 bar)	N/A
P-673	5/16-24 Flat Btm, Female	M6 Flat Btm, Male	0.040" (1.00)	9.9 µL	1,000 PSI (69 bar)	N/A
P-694	1/4-28 Flat Btm, Female	M6 Flat Btm, Male	0.040" (1.00)	11.3 µL	1,000 PSI (69 bar)	N/A
STAINLESS STEEL ADAPTERS						
1587	10-32 Coned, Female	M6 Flat Btm, Male	0.040" (1.00)	0.68 µL	N/A*	U-400/U-401

*The pressure ratings of these adapters exceed the pressure holding ability of the fittings and tubing used with them.

Idex Quick Connect Luer Adapters

Please Note: Idex Female Quick Connect Luer Adapters can be used with any of the Male Luers on this page, i.e., those with and without lock hubs.

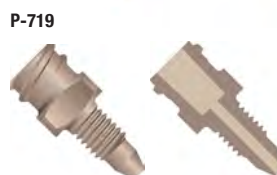
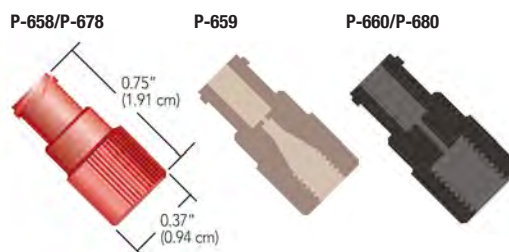
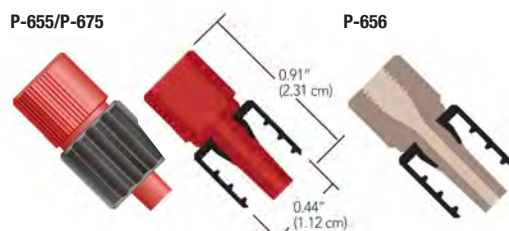
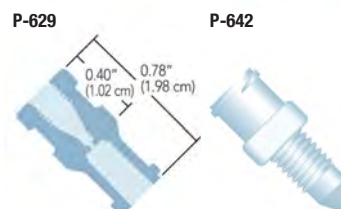
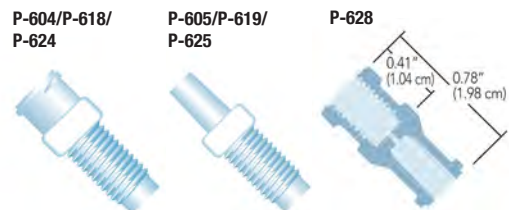
APP NOTE

- The A-626 Bottle Cap Plug can be used to plug any of the female luer adapters on this page.
- To prevent a chemical spill when disconnecting your solvent reservoir tubing from the pump, try our Quick-Stop Luer Check Valve
- To economically prime an HPLC pump, simply remove the 10-32 fitting on the outlet check valve (standard on most models), insert a P-642 luer adapter, attach a syringe (such as the B-310) and draw the mobile phase through the pump head.

IDEX QUICK CONNECT LUER ADAPTERS

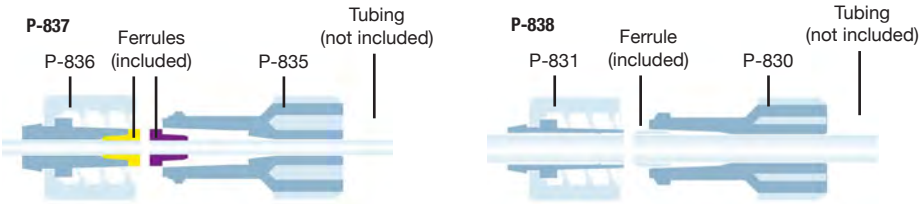
PART NO	LUER	THREAD	THRU-HOLE	BODY MATERIAL	LOCK HUB MATERIAL
QUICK CONNECT LUER ADAPTERS					
P-604	Female Luer	1/4-28 Flat Btm, Male	0.05" (1.3 mm)	Nat. Delrin	N/A
P-605	Male Luer	1/4-28 Flat Btm, Male	0.04" (1.0 mm)	Nat. Delrin	N/A
P-618	Female Luer	1/4-28 Flat Btm, Male	0.05" (1.3 mm)	Nat. PP	N/A
P-618L	Female Luer	1/4-28 Flat Btm, Male	0.125" (3.17 mm)	Nat. PP	N/A
P-619	Male Luer	1/4-28 Flat Btm, Male	0.05" (1.3 mm)	Nat. PP	None*
P-624	Female Luer	1/4-28 Flat Btm, Male	0.05" (1.3 mm)	Nat. ETFE	N/A
P-625	Male Luer	1/4-28 Flat Btm, Male	0.04" (1.0 mm)	Nat. ETFE	None*
P-628	Female Luer	1/4-28 Flat Btm, Female	0.04" (1.0 mm)	Nat. ETFE	N/A
P-628P	Female Luer	1/4-28 Flat Btm, Female	0.04" (1.0 mm)	Nat. PP	N/A
P-628S	Female Luer	1/4-28 Flat Btm, Female	0.06" (1.55 mm)	Nat. ETFE	N/A
P-629	Female Luer	10-32 Coned, Female	0.04" (1.0 mm)	Nat. ETFE	N/A
P-642	Female Luer	10-32 Coned, Male	0.05" (1.3 mm)	Nat. ETFE	N/A
P-655	Male Luer	1/4-28 Flat Btm, Female	0.04" (1.0 mm)	Red PEEK	Black PEEK
P-656	Male Luer	10-32 Coned, Female	0.05" (1.3 mm)	Nat. PEEK	Black PEEK
P-657	Male Luer	M6 Flat Btm, Female	0.05" (1.3 mm)	Black PEEK	Black PEEK
P-658	Female Luer	1/4-28 Flat Btm, Female	0.05" (1.3 mm)	Red PEEK	N/A
P-659	Female Luer	10-32 Coned, Female	0.05" (1.3 mm)	Nat. PEEK	N/A
P-660	Female Luer	M6 Flat Btm, Female	0.05" (1.3 mm)	Black PEEK	N/A
P-661	Female Luer	5/16-24 Flat Btm, Male	0.05" (1.3 mm)	Nat. ETFE	N/A
P-675	Male Luer	1/4-28 Flat Btm, Female	0.05" (1.3 mm)	Red ETFE	Nat. PP
P-676	Male Luer	10-32 Coned, Female	0.05" (1.3 mm)	Nat. ETFE	Nat. PP
P-677	Male Luer	M6 Flat Btm, Female	0.05" (1.3 mm)	Red ETFE	Nat. PP
P-678	Female Luer	1/4-28 Flat Btm, Female	0.05" (1.3 mm)	Red ETFE	N/A
P-679	Female Luer	10-32 Coned, Female	0.05" (1.3 mm)	Nat. ETFE	N/A
P-680	Female Luer	M6 Flat Btm, Female	0.05" (1.3 mm)	Black ETFE	N/A
P-683	Male Luer	1/4-28 Flat Btm, Male	0.04" (1.0 mm)	Nat. PEEK	Black PEEK
P-686	Female Luer	M6 Flat Btm, Male	0.05" (1.3 mm)	Black ETFE	N/A
P-719	Female Luer	10-32 Coned, Male	0.05" (1.3 mm)	Nat. PEEK	N/A

*Slip-type male luer



LuerTight™ Fittings

- ➔ Reliably hold your fluoropolymer tubing in place with the convenience of a luer connection
- ➔ Quick disconnect and barbless



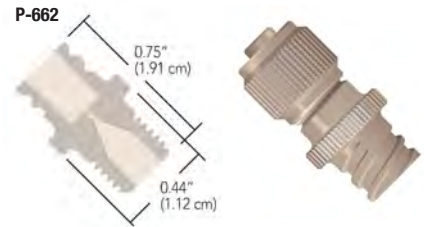
NOTE

LuerTight fittings are designed to be used exclusively within the LuerTight family. Combining LuerTight fittings with non-LuerTight luer products may result in a poor connection.

Luer-To-MicroTight® Adapter

- ➔ Easily connect 360 µm OD tubing to a syringe

The Upchurch Scientific Luer-to-MicroTight Adapter is ideal for infusing sample into lab-on-a-chip devices. This product is made entirely of biocompatible PEEK polymer and introduces only 14 nL of additional volume to the flow path. Use it to directly connect a luer-tip syringe or other product that terminates with a standard male luer to 360 µm OD capillary tubing without tubing sleeves. MicroTight Fittings are included.

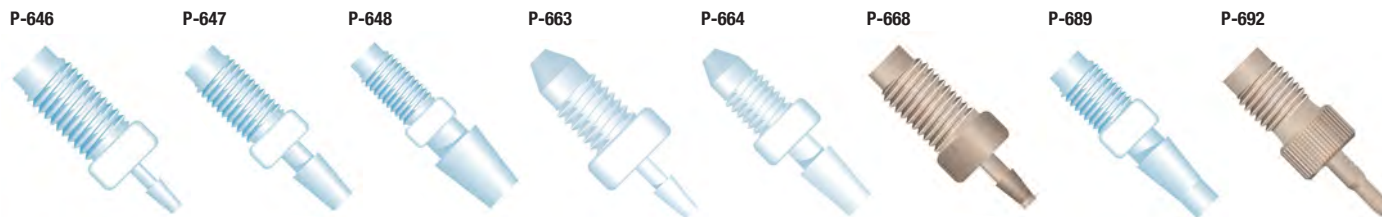


LUER ADAPTERS						
PART NO	DESCRIPTION	TUBING OD	THRU-HOLE	PRESSURE RATING	MATERIAL	INCLUDES
LUERTIGHT FITTINGS SYSTEMS						
P-837	LuerTight Fitting	1/16" OD	N/A	100 PSI (7 bar)	PP, ETFE	(1) P-835, (1) P-836, (1) P-830T
P-838	LuerTight Fitting	1/8" OD	N/A	100 PSI (7 bar)	PP, ETFE	(1) P-830, (1) P-831, (1) P-830T
LUERTIGHT FITTINGS COMPONENTS						
P-830	Ferrule Fitting	1/8" OD	N/A	N/A	ETFE	(1) Ferrule
P-831	Male Fitting	1/8" OD	N/A	N/A	ETFE	No Ferrule Required
P-835	Ferrule Fitting	1/16" OD	N/A	N/A	ETFE	(1) Ferrule
P-836	Male Fitting	1/16" OD	N/A	N/A	ETFE	(1) Ferrule
P-830T	Set Plug to swage Ferrules into P-835 and P-830		N/A	N/A	ETFE	N/A
LUER-TO-MICROTIGHT ADAPTER						
P-662	Luer-to-MicroTight Adapter		0.006" (0.15 mm)	45 PSI (2.5 bar)	PEEK	(1) F-152, (1) P-416

Ferrule = internal receiving luer pocket; Male = external luer nose (surrounded by internally-threaded locking ring)

Barbed Adapters

Thread to Barbed Adapters



Swivel Barb Adapters

➔ Barb connection spins freely from the nut to prevent twist during installation



Luer to Barbed Adapters

Barb to Slip-Type Male Luer Adapters

Barb to Male Luer with Lock Ring Adapters

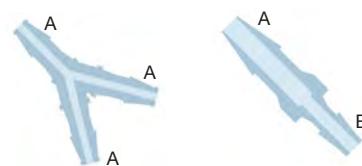
Barb to Female Luer-Lock Connectors



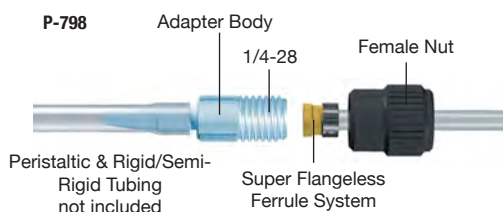
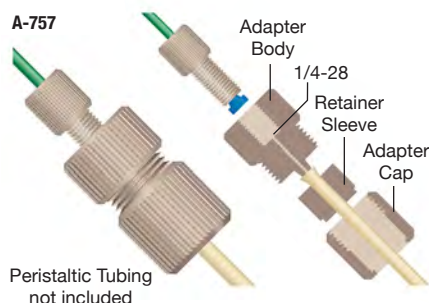
BARBED ADAPTERS				
PART NO	TUBING ID	THREADS	THRU-HOLE	MATERIAL
THREAD TO BARBED ADAPTERS				
P-639	1/16" (1.55 mm)	10-32 Flat Btm	0.02" (0.5 mm)	PEEK
P-646	1/16" (1.55 mm)	1/4-28 Flat Btm	0.04" (1.0 mm)	ETFE
P-647	1/8" (3.20 mm)	1/4-28 Flat Btm	0.08" (2.0 mm)	ETFE
P-648	3/16" (4.75 mm)	1/4-28 Flat Btm	0.10" (2.5 mm)	ETFE
P-663	1/16" (1.55 mm)	10-32 Coned	0.04" (1.0 mm)	ETFE
P-664	1/8" (3.20 mm)	10-32 Coned	0.04" (1.0 mm)	ETFE
P-665	1/8" (3.20 mm)	10-32 Coned	0.04" (1.0 mm)	ETFE
P-668	1/16" (1.55 mm)	1/4-28 Flat Btm	0.04" (1.0 mm)	PEEK
P-689	1/16" (1.55 mm)	5/16-24 Flat Btm	0.10" (2.5 mm)	ETFE
P-690	1/16" – 3/32" (1.55 – 2.38 mm)	1/4-28 Flat Btm	0.04" (1.0 mm)	ETFE
P-691	3/32" – 1/8" (2.38 – 3.20 mm)	1/4-28 Flat Btm	0.06" (1.50 mm)	ETFE
P-692	0.020" – 1/32" (0.50 – 0.80 mm)	1/4-28 Flat Btm	0.02" (0.5 mm)	PEEK
SWIVEL BARB ADAPTERS				
D-646	1/16" (1.55 mm)	1/4-28 Flat Btm	0.03" (0.75 mm)	Polypropylene
D-647	3/32" (2.40 mm)	1/4-28 Flat Btm	0.056" (1.5 mm)	Polypropylene
D-648	1/8" (3.20 mm)	1/4-28 Flat Btm	0.08" (2.0 mm)	Polypropylene
LUER TO BARB ADAPTERS				
P-854	1/16" (1.55 mm)	Male Luer (Slip-type)	0.046"	Polypropylene
P-850	1/16" (1.55 mm)	Male Luer with Lock Ring	0.049"	Polypropylene
P-851	3/32" (2.40 mm)	Male Luer with Lock Ring	0.071"	Polypropylene
P-852	1/8" (3.20 mm)	Male Luer with Lock Ring	0.099"	Polypropylene
P-853	5/32" (4.0 mm)	Male Luer with Lock Ring	0.108"	Polypropylene
P-857	1/16" (1.55 mm)	Female Luer Connection	0.030"	Polypropylene
P-858	3/32" (2.40 mm)	Female Luer Connection	0.056"	Polypropylene
P-859	1/8" (3.20 mm)	Female Luer Connection	0.080"	Polypropylene
P-870	1/16" (1.55 mm)	Female Luer Connection	0.030"	ETFE
P-871	3/32" (140 mm)	Female Luer Connection	0.056"	ETFE
P-872	1/8" (3.20 mm)	Female Luer Connection	0.080"	ETFE

Barbed Connectors

BARBED CONNECTORS			
PART NO	TUBING ID A	TUBING ID B	MATERIAL
BARBED UNION			
P-801	0.06" (1.5 mm)	0.06" (1.5 mm)	Polypropylene
P-802	0.12" (3.0 mm)	0.12" (3.0 mm)	Polypropylene
P-803	0.19" (4.8 mm)	0.19" (4.8 mm)	Polypropylene
P-805	0.37" (9.5 mm)	0.37" (9.5 mm)	Polypropylene
BARBED REDUCING UNION			
P-807	0.06" (1.6 mm)	0.13" (3.2 mm)	Polypropylene
P-808	0.13" (3.2 mm)	0.18" (4.6 mm)	Polypropylene
P-809	0.18" (4.6 mm)	0.25" (6.4 mm)	Polypropylene
P-810	0.25" (6.4 mm)	0.37" (9.5 mm)	Polypropylene
BARBED Y CONNECTOR			
P-860	0.06" (1.5 mm)		Polypropylene
P-861	0.10" (2.5 mm)		Polypropylene
P-862	0.12" (3.0 mm)		Polypropylene
P-863	0.18" (4.8 mm)		Polypropylene
P-864	0.25" (6.4 mm)		Polypropylene









Peristaltic Tubing Adapters & Conical Adapters



PERISTALTIC TUBING ADAPTERS & CONICAL ADAPTERS				
PART NO	DESCRIPTION	PERISTALTIC TUBING OD	PERISTALTIC TUBING ID	THRU-HOLE
PERISTALTIC TUBING ADAPTERS				
P-757	Standard Adapter	up to 0.180" (4.55 mm)	0.048" – 0.110" (1.20 – 2.80 mm)	0.030" (0.75 mm)
P-767	Large Bore Adapter	up to 0.250" (6.35 mm)	0.100" – 0.150" (2.55 – 3.80 mm)	0.070" (1.78 mm)
PART NO	DESCRIPTION	RIGID OR SEMI-RIGID TUBING OD	PERISTALTIC TUBING ID	THRU-HOLE
CONICAL ADAPTER ASSEMBLIES				
P-794	Conical Adapter	1/16"	0.020" – 0.030" (0.50 mm – 0.75 mm)	0.020" (0.50 mm)
P-797	Conical Adapter	1/16"	1/16" – 3/32" (1.55 mm – 2.40 mm)	0.040" (1.00 mm)
P-798	Conical Adapter	1/8"	1/16" – 3/32" (1.55 mm – 2.40 mm)	0.040" (1.00 mm)
P-799	Conical Adapter	1/8"	3/32" – 1/8" (2.40 mm – 3.20 mm)	0.060" (1.5 mm)
PART NO	DESCRIPTION	MATERIAL	FOR USE WITH	
CONICAL ADAPTER REPLACEMENT PARTS				
F-156	Female Nut, 1/8", 1/4-28	Black PEEK	P-798, P-799	
P-420	Female Nut, 1/16", 1/4-28	Natural PEEK	P-794, P-797	
P-259	Super Flangeless Ferrule, 1/16"	Yellow ETFE/SS	P-794, P-797	
P-359	Super Flangeless Ferrule, 1/8"	Yellow ETFE/SS	P-798, P-799	
P-691	Conical Adapter Body	Natural ETFE	P-799	
P-692	Conical Adapter Body	Natural PEEK	P-794	

IDEX Polymeric Tubing

						
TUBING	PEEK	CAPILLARY PEEK	ETFE	DuPont® FEP	DuPont PFA	DuPont HIGH PURITY PFA
Page	253	253	254	253	254	287
Description	<p>Biocompatible chemically inert to most commonly used solvents. PEEK tubing is flexible, offers a very smooth internal surface, and can be easily cut to desired length.</p> <ul style="list-style-type: none"> • Great alternative for stainless steel tubing in high pressure applications • Many sizes available in color scheme to help identify ID 	<p>All the benefits of larger sized PEEK tubing while serving as an excellent alternative to more traditional fused silica and stainless steel capillary tubing. Capillary PEEK tubing is available in a wide range of micro and nano-scale inner diameters.</p> <ul style="list-style-type: none"> • Available in common capillary tubing sizes with tight tolerances • Tubing sleeves available for capillary tubing connections 	<p>ETFE is chemically inert and more suitable for higher pressure applications (when using aqueous mobile phases) than PTFE, FEP, and PFA. Additionally, because ETFE is more rigid than PTFE, FEP, and PFA, this tubing better resists inner diameter collapse.</p> <ul style="list-style-type: none"> • Excellent solvent resistance • More durable and less gas permeable than PTFE, FEP, and PFA • Operating temperatures up to 80 °C 	<p>FEP tubing is a great alternative to traditional PTFE tubing, desirable for use because it is chemically inert to most solvents, easy to cut, and translucent for easy monitoring of solutions passing through.</p> <ul style="list-style-type: none"> • Great for general, low pressure applications • Many sizes available in multiple colors for easy identification • Tight manufacturing tolerances to ensure product consistency 	<p>Offers excellent chemical compatibility, plus due to its inner surface smoothness PFA tubing tends to be more translucent than PTFE tubing.</p> <ul style="list-style-type: none"> • Offers higher purity and enhanced translucence when compared with other fluoropolymer tubing • Great for more critical, low pressure applications 	<p>This polymer tubing is manufactured from a premium grade of PFA—one of the most contaminant-free polymers on the market.</p> <ul style="list-style-type: none"> • Offers chemical stability, mechanical strength, and purity for applications such as medical, diagnostic, pharmaceutical, biotechnology, and semiconductor • Excellent replacement for PTFE where gas permeability and surface texture are issues • Clarity of tubing makes PFA an excellent choice for monitoring fluid movement
Specifications						
OD (outside diameter)	1/16" (1.55 mm), 1/8" (3.5 mm)	0.0145" (360 µm), 1/32" (785 µm)	1/16" (1.55 mm), 1/8" (3.2 mm)	0.040" (1.0 mm), 1/16" (1.55 mm), 0.080" (2.0 mm), 0.118" (3.0 mm), 1/8" (3.2 mm)	1/16" (1.55 mm), 1/8" (3.2 mm)	0.0145" (360 µm), 1/16" (1.55 mm), 1/8" (3.2 mm), 3/16" (4.8 mm), 1/4" (6.35 mm)
ID (inside diameter)	0.025" (65 µm) – 0.080" (2.0 mm)	0.001" (25 µm) – 0.020" (0.50 mm)	0.010" (0.25 mm) – 0.093" (2.40 mm)	0.020" (0.50 mm) – 0.080" (2.0 mm)	0.020" (0.50 mm) – 0.062" (1.55 mm)	0.020" (0.50 mm) – 0.188" (4.80 mm) 0.002" (50 µm) – 0.006" (150 µm) for 360 µm tubing
Operating Temp	-51 to 100 °C	-51 to 100 °C	-51 to 80 °C	-51 to 100 °C	-51 to 80 °C	-51 to 80 °C
Pressure Rating	3000 – 10,000 PSI (207 – 690 bar)	2,000 – 5,000 PSI (138 – 345 bar)	500 – 4,000 PSI (34 – 276 bar)	2,500 – 4,000 PSI (172 – 276 bar)	500 – 2,000 PSI (34 – 138 bar)	250 – 2,000 PSI (17 – 138 bar) 1,750 – 3,500 PSI (121 – 241 bar) for 360 µm tubing
Typical Tolerances	± 0.001" (25 µm) for 1/16" OD tubing, ± 0.003" (75 µm) for 1/8" OD tubing	± 0.0005" (12.5 µm)	± 0.001" (25 µm) for 1/16" OD tubing, ± 0.003" (75 µm) for 1/8" OD tubing	± 0.001" (25 µm) for 1/16" OD tubing, ± 0.003" (75 µm) for 1/8" OD tubing	± 0.001" (25 µm) for 1/16" OD tubing, ± 0.003" (75 µm) for 1/8" OD tubing	± 0.001" (25 µm) for 1/16" OD tubing, ± 0.0005" (12.5 µm) for 360 µm tubing
Refractive Index (Clarity)	Opaque	Opaque	1.4	1.338	1.34	1.34
pH Range	0 – 14	0 – 14	0 – 14	0 – 14	0 – 14	0 – 14
Sterilization Techniques	Gamma irradiation; ethylene oxide; thermal	Gamma irradiation; ethylene oxide; thermal	Ethylene oxide	Ethylene oxide; thermal	Ethylene oxide; thermal	Gamma irradiation; ethylene oxide; thermal
Autoclavable?	Y	Y	Y	Y	Y	Y

PEEK Tubing

PEEK tubing has a very smooth internal surface, which causes less turbulence than the similarly sized metal tubing. Of all our polymer tubing materials, PEEK is the least permeable to gas.



PEEK TUBING			
PART NO	ID	COLOR	MAX PRESSURE
PEEK TUBING, 1/16" OD X 5' (1.5 M)			
1560	0.0025" (65 µm)	Natural	7,000 PSI (483 bar)
1561	0.004" (0.10 mm)	Black	7,000 PSI (483 bar)
★ 1535	0.005" (0.125 mm)	Red	7,000 PSI (483 bar)
1535XL*	0.005" (0.125 mm)	Red	7,000 PSI (483 bar)
1536	0.007" (0.175 mm)	Yellow	7,000 PSI (483 bar)
1531	0.010" (0.25 mm)	Natural	7,000 PSI (483 bar)
★ 1531B	0.010" (0.25 mm)	Blue	7,000 PSI (483 bar)
★ 1531BXL*	0.010" (0.25 mm)	Blue	7,000 PSI (483 bar)
★ 1532	0.020" (0.50 mm)	Orange	7,000 PSI (483 bar)
★ 1532XL*	0.020" (0.50 mm)	Orange	7,000 PSI (483 bar)
1533	0.030" (0.75 mm)	Green	7,000 PSI (483 bar)
1533XL*	0.030" (0.75 mm)	Green	7,000 PSI (483 bar)
1538	0.040" (1.00 mm)	Natural	5,000 PSI (345 bar)
1538XL*	0.040" (1.00 mm)	Natural	5,000 PSI (345 bar)
PEEK TUBING, 1/8" OD X 5' (1.5 M)			
1534	0.062" (1.55 mm)	Natural	4,000 PSI (276 bar)
1544	0.080" (2.0 mm)	Natural	3,000 PSI (207 bar)

*XL Designates 100' length

Typical Tolerances: ± 0.001" (25 µm) for 1/16" OD tubing,
± 0.003" (75 µm) for 1/8" OD tubing

★ TOP SELLER!

Capillary Tubing

CAPILLARY PEEK TUBING			
PART NO	ID	COLOR	MAX PRESSURE
CAPILLARY PEEK TUBING, 360 µm OD X 5' (1.5 M)			
1574	0.001" (25 µm)	Natural	5,000 PSI (345 bar)
1570	0.002" (50 µm)	Natural	2,000 PSI (138 bar)
1571	0.004" (100 µm)	Red	2,000 PSI (138 bar)
1572	0.006" (150 µm)	Yellow	2,000 PSI (138 bar)
CAPILLARY PEEK TUBING, 1/32" OD X 5' (1.5 M)			
1576	0.005" (0.125 mm)	Red	5,000 PSI (345 bar)
1577	0.007" (0.175 mm)	Yellow	5,000 PSI (345 bar)
1581	0.010" (0.25 mm)	Blue	5,000 PSI (345 bar)
1568	0.015" (0.40 mm)	Natural	5,000 PSI (345 bar)
1569	0.020" (0.50 mm)	Orange	5,000 PSI (345 bar)

DuPont® FEP Fluoropolymer Tubing

FEP (fluorinated ethylene propylene) tubing is great for general, low pressure applications and is held to tight tolerances and has low gas permeability.



Much of our FEP Tubing—even the color-tinted options—is translucent, making it possible to watch fluid flow. Black FEP tubing is available for light-sensitive applications (such as enzymatic and chemiluminescent reactions) and entering/exiting flow cells.

DuPont® FEP FLUOROPOLYMER TUBING				
PART NO	ID	LENGTH	COLOR	MAX PRESSURE
FEP TUBING, 1/16" OD				
★ T-10203	0.020" (0.50 mm)	10' (3 m)*	Natural	2,000 PSI (138 bar)
★ T-10202	0.030" (0.75 mm)	10' (3 m)*	Natural	1,000 PSI (69 bar)
FEP TUBING, 1/8" OD				
★ T-10201	0.062" (1.55 mm)	10' (3 m)*	Natural	500 PSI (34 bar)
FEP TUBING, 1.0 mm OD				
1671L	0.020" (0.50 mm)	50' (15 m)	Natural	500 PSI (34 bar)
FEP TUBING, 2.0 mm OD				
1673L	0.040" (1.0 mm)	50' (15 m)	Natural	500 PSI (34 bar)
FEP TUBING, 3.0 mm OD				
1677L	0.080" (2.0 mm)	50' (15 m)	Natural	500 PSI (34 bar)

*Lengths > 10' available. Specify length at time of order.

Typical Tolerances: ± 0.001" (25 µm) for 1/16" OD tubing
± 0.003" (75 µm) for 1/8" OD tubing

TECH TIP

Our 5' length PEEK tubing is rough cut to approximately 5'1". A trim cut should be made before use, we recommend a polymer tubing cutter.



A-327 for 1/16" and 1/8" OD tubing

A-329 for 3/16" – 5/16" OD tubing

POLYMER TUBING CUTTERS			
PART NO	CUTS TUBING OD	INCLUDES	QTY
★ A-327	1/16" and 1/8" OD	(1) A-328	ea
A-329	3/16" – 5/16" OD	(1) A-328	ea
A-328	Replacement blades		5/pk

★ TOP SELLER!

ETFE Tubing

- Excellent solvent resistance
- More durable and less gas permeable than PTFE, FEP, and PFA
- Operating temperatures up to 80 °C



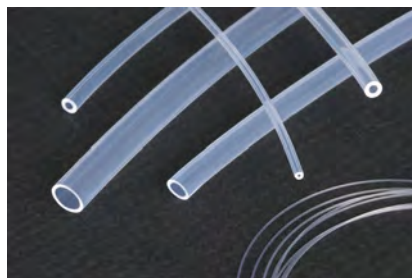
ETFE is chemically inert and more suitable for higher pressure applications (when using aqueous mobile phases) than PTFE, FEP, and PFA. Additionally, because ETFE is more rigid than PTFE, FEP, and PFA, this tubing better resists inner diameter collapse.

Tubing tolerance for 1/16" OD is ± 0.001 " (25 μm). Tubing tolerance for 1/8" OD is ± 0.003 " (75 μm).

ETFE TUBING				
PART NO	ID	LENGTH	MAX PRESSURE	COLOR
ETFE TUBING, 1/16" OD				
1529	0.010" (0.25 mm)	5' (1.5 m)	4,000 PSI (276 bar)	Natural
1529L	0.010" (0.25 mm)	50' (15 m)	4,000 PSI (276 bar)	Natural
1529XL	0.010" (0.25 mm)	100' (30 m)	4,000 PSI (276 bar)	Natural
1516	0.020" (0.50 mm)	5' (1.5 m)	3,000 PSI (207 bar)	Natural
1516L	0.020" (0.50 mm)	50' (15 m)	3,000 PSI (207 bar)	Natural
1516XL	0.020" (0.50 mm)	100' (30 m)	3,000 PSI (207 bar)	Natural
1528	0.030" (0.75 mm)	5' (1.5 m)	2,000 PSI (138 bar)	Natural
1528L	0.030" (0.75 mm)	50' (15 m)	2,000 PSI (138 bar)	Natural
1528XL	0.030" (0.75 mm)	100' (30 m)	2,000 PSI (138 bar)	Natural
1517	0.040" (1.00 mm)	5' (1.5 m)	500 PSI (34 bar)	Natural
1517L	0.040" (1.00 mm)	50' (15 m)	500 PSI (34 bar)	Natural
1517XL	0.040" (1.00 mm)	100' (30 m)	500 PSI (34 bar)	Natural
ETFE TUBING, 1/8" OD				
1530	0.062" (1.55 mm)	5' (1.5 m)	1,000 PSI (69 bar)	Natural
1530L	0.062" (1.55 mm)	50' (15 m)	1,000 PSI (69 bar)	Natural
1530XL	0.062" (1.55 mm)	100' (30 m)	1,000 PSI (69 bar)	Natural
1648	0.093" (2.40 mm)	5' (1.5 m)	500 PSI (34 bar)	Natural
1648L	0.093" (2.40 mm)	50' (15 m)	500 PSI (34 bar)	Natural
1648XL	0.093" (2.40 mm)	100' (30 m)	500 PSI (34 bar)	Natural

DuPont® PFA Tubing & High Purity PFA Tubing

DuPont® PFA tubing offers excellent chemical compatibility, plus due to its inner surface smoothness PFA tubing tends to be more translucent than PTFE tubing.



DuPont® High Purity PFA polymer tubing is manufactured from a premium grade of PFA—one of the most contaminant-free polymers on the market.

DuPont® PFA TUBING				
PART NO	ID	LENGTH	MAX PRESSURE	COLOR
PFA TUBING, 1/16" OD				
1500	0.020" (0.50 mm)	5' (1.5 m)	2,000 PSI (138 bar)	Natural
1512L	0.020" (0.50 mm)	50' (15 m)	2,000 PSI (138 bar)	Natural
1514L	0.030" (0.75 mm)	50' (15 m)	1,000 PSI (69 bar)	Natural
1507L	0.040" (1.0 mm)	50' (15 m)	500 PSI (34 bar)	Natural
PFA TUBING, 1/8" OD				
1509L	0.062" (1.55 mm)	50' (15 m)	500 PSI (34 bar)	Natural

DuPont® HIGH PURITY PFA TUBING				
PART NO	ID	LENGTH	MAX PRESSURE	COLOR
PFA HP TUBING, 1/16" OD				
1622L	0.020" (0.50 mm)	50' (15 m)	2,000 PSI (138 bar)	Natural
1632L	0.030" (0.75 mm)	50' (15 m)	1,000 PSI (69 bar)	Natural
PFA HP TUBING, 1/8" OD				
1641L	0.062" (1.55 mm)	50' (15 m)	500 PSI (34 bar)	Natural
PFA HP TUBING, 3/16" OD				
1642L	0.125" (3.20 mm)	50' (15 m)	250 PSI (17 bar)	Natural
1642XL	0.125" (3.20 mm)	100' (30 m)	250 PSI (17 bar)	Natural
PFA HP TUBING, 1/4" OD				
1645L	0.188" (4.80 mm)	50' (15 m)	250 PSI (17 bar)	Natural
1645XL	0.188" (4.80 mm)	100' (30 m)	250 PSI (17 bar)	Natural
PFA HP PLUS TUBING, 1/16" OD				
1902L	0.010" (0.25 mm)	50' (15 m)	3,000 PSI (207 bar)	Natural
1907L	0.020" (0.50 mm)	50' (15 m)	2,000 PSI (138 bar)	Natural
1912L	0.030" (0.75 mm)	50' (15 m)	1,000 PSI (69 bar)	Natural
PFA HP PLUS TUBING, 360 μm OD				
1930	50 μm (0.002")	5' (1.5 m)	3,500 PSI (241 bar)	Natural
1931	75 μm (0.003")	5' (1.5 m)	3,000 PSI (207 bar)	Natural
1932	100 μm (0.004")	5' (1.5 m)	2,500 PSI (172 bar)	Natural
1933	150 μm (0.006")	5' (1.5 m)	1,750 PSI (121 bar)	Natural

Tubing Cutters

Polymer Tubing Cutters

➔ For 1/16", 1/8", 3/16", 1/4", and 5/16" OD tubing

A flat, 90°, burr-free cut is difficult to obtain with the most commercial polymer tubing cutters. Upchurch Scientific® has designed several tubing cutters specifically to cut polymer tubing. This line of tubing cutters includes a standard cutter for 1/16" and 1/8" OD tubing (A-327), and another for large bore tubing (A-329). Each has guide holes to ensure precise cutting. These cutters are durable, reliable, and easy to operate. Five replacement blades are included with each tool.



Capillary Polymer Tubing Cutters

The Upchurch Scientific A-350 Cutter is designed to cut capillary sized polymer tubing. The cutter makes clean, perpendicular cuts without collapsing thin capillary walls. A set of ten tubing sleeves, required for cutting, are included with each cutter, along with five 360 µm OD polymer capillary tubing. Alternative sleeves are 2" long and are made of DuPont® FEP.



Fused Silica Tubing Cutters

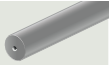


We offer a precision cutter for fused silica tubing—SG's Shortix™ Cutter (FS-315). This cutter ensures clean, trouble-free cutting of fused silica tubing, providing better cuts than any other product on the market. It also includes a built-in magnifying glass to examine the cut tubing ends. Order the FS-315-02 Maintenance Kit, as needed, to replace a worn or damaged cutting wheel.

Please Note: The FS-315 Fused Silica Tubing Cutters are designed to cut only tubing with ODs of 350 µm – 780 µm and IDs of 100 µm – 350 µm.



TUBING CUTTERS					
PART NO	DESCRIPTION	FOR TUBING SIZE	INCLUDES		QTY
CAPILLARY POLYMER TUBING CUTTER					
A-350	Capillary Polymer Tubing Cutter	360 µm – 1/32" OD	(1) A-328 Replacement Blades, 5/pk (1) F-262x Sleeves, 10/pk and (1) M-438-03 Wrench		ea
A-327	Standard Polymer Tubing Cutter	1/16" and 1/8" OD	(1) A-328 Replacement Blades, 5/pk		ea
A-329	Large Bore Polymer Tubing Cutter	3/16" – 5/16" OD	(1) A-328 Replacement Blades, 5/pk		ea
A-328	Replacement Blades for A-350, A-327 and A-329	—	—		5/pk
FUSED SILICA TUBING CUTTERS					
FS-315	Shortix Fused Silica Tubing Cutter	350 µm – 780 µm OD	—		ea

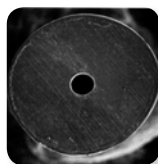
IDEX High Pressure Tubing

			
TUBING	STAINLESS STEEL	FUSED SILICA	PEEKsil™
Page	257	260	261
Description	<p>Seamless, pre-cut 316 stainless steel tubing meets the exacting requirements of today's analyses. Thorough preparation guarantees that the tubing is truly ready-to-use, with flat-burr-free ends and a clean finish.</p> <ul style="list-style-type: none"> • Wide selection of outside and inside diameters and lengths • Pre-cut to ensure burr-free, flat connections • Many sizes feature a color-coded band for easy ID identification 	<p>Because of the tight tolerances of fused silica's inner diameters, this tubing is used for micro-scale analyses such as micro and nano-HPLC and capillary electrophoresis.</p> <ul style="list-style-type: none"> • Most commonly used OD and ID sizes available • High quality polyimide-clad fused silica • Offered in convenient, two meter lengths 	<p>PEEKsil is mechanically strong and has ideal characteristics for sealing with metal or polymer fittings.</p> <ul style="list-style-type: none"> • Comprised of high quality fused silica sheathed by PEEK tubing • Excellent chemical compatibility • Very tight manufacturing tolerances • Good replacement for stainless steel, PEEK, or standard fused silica
Specifications			
OD (outside diameter)	1/16" (1.55 mm), 1/8" (3.2 mm)	0.0145" (360 µm)	1/32" (785 µm), 1/16" (1.55 mm)
ID (inside diameter)	0.004" (100 µm) – 0.080" (2.0 mm)	0.0008" (20 µm) – 0.006" (150 µm)	0.001" (25 µm) – 0.012" (300 µm)
Operating Temp	-51 to 289 °C	-51 to 100 °C	-51 to 100 °C
Pressure Rating	N/A*	N/A*	10,000 PSI (690 bar)
Typical Tolerances	± 0.001" (25 µm) for 1/16" OD tubing, ± 0.003" (75 µm) for 1/8" OD tubing	± 0.0004" (10 µm)	± 0.0004" (10 µm)
Refractive Index (Clarity)	Opaque	1.78	Opaque
pH Range	1 – 14	0 – 10	0 – 10
Sterilization Techniques	Gamma irradiation; ethylene oxide; thermal	Ethylene oxide; thermal	Ethylene oxide; thermal
Autoclavable?	Y	Y	Y

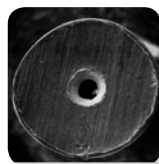
*The manufacturer of this tubing or material does not publish this specification.

VICI TUBING SPECIFICATIONS					
ID	µl/cm	µl/in	ID	µl/cm	µl/in
.005"	0.13	0.32	.030"	4.56	11.58
.010"	0.51	1.29	.040"	8.11	20.59
.015"	1.14	2.90	.060"	18.24	46.33
.020"	2.03	5.15	.070"	24.83	63.06
.025"	3.17	8.04	.085"	36.61	92.99

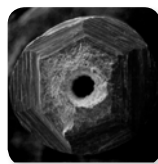
IDEX Precut 316 Stainless Steel Tubing



Precut tubing



Commercially available tubing cutter



File cut tubing

IDEX PRECUT 316 STAINLESS STEEL TUBING			
PART NO	ID	LENGTH	COLOR ID BAND
IDEX PRECUT STAINLESS STEEL, 1/16" OD			
U-152	0.005" (0.125 mm)	2" (5 cm)	Red
U-153	0.005" (0.125 mm)	4" (10 cm)	Red
U-154	0.005" (0.125 mm)	8" (20 cm)	Red
U-155	0.005" (0.125 mm)	12" (30 cm)	Red
U-156	0.005" (0.125 mm)	1.6' (50 cm)	Red
U-157	0.005" (0.125 mm)	3.2' (1 m)	Red
U-158	0.005" (0.125 mm)	5' (1.5 m)*	Red
U-160	0.005" (0.125 mm)	25' (7.6 m)*	Red
★ U-126	0.007" (0.175 mm)	2" (5 cm)	Black
U-127	0.007" (0.175 mm)	4" (10 cm)	Black
U-128	0.007" (0.175 mm)	8" (20 cm)	Black
U-129	0.007" (0.175 mm)	12" (30 cm)	Black
U-130	0.007" (0.175 mm)	1.6' (50 cm)	Black
U-131	0.007" (0.175 mm)	3.2' (1 m)	Black
U-108	0.007" (0.175 mm)	5' (1.5 m)*	Black
U-161	0.007" (0.175 mm)	25' (7.6 m)*	Black
★ U-111	0.010" (0.25 mm)	2" (5 cm)	Blue
★ U-112	0.010" (0.25 mm)	4" (10 cm)	Blue
U-113	0.010" (0.25 mm)	8" (20 cm)	Blue
★ U-114	0.010" (0.25 mm)	12" (30 cm)	Blue
U-132	0.010" (0.25 mm)	1.6' (50 cm)	Blue
U-133	0.010" (0.25 mm)	3.2' (1 m)	Blue
U-106	0.010" (0.25 mm)	5' (1.5 m)*	Blue
U-162	0.010" (0.25 mm)	25' (7.6 m)*	Blue
U-101	0.020" (0.5 mm)	2" (5 cm)	Yellow
U-102	0.020" (0.5 mm)	4" (10 cm)	Yellow
U-103	0.020" (0.5 mm)	8" (20 cm)	Yellow
U-104	0.020" (0.5 mm)	12" (30 cm)	Yellow
U-134	0.020" (0.5 mm)	1.6' (50 cm)	Yellow
U-135	0.020" (0.5 mm)	3.2' (1 m)	Yellow
★ U-105	0.020" (0.5 mm)	5' (1.5 m)*	Yellow
U-163	0.020" (0.5 mm)	25' (7.6 m)*	Yellow

★ TOP SELLER!

IDEX PRECUT 316 STAINLESS STEEL TUBING			
PART NO	ID	LENGTH	COLOR ID BAND
IDEX PRECUT STAINLESS STEEL, 1/16" OD (CONT.)			
U-115	0.030" (0.75 mm)	2" (5 cm)	White
U-116	0.030" (0.75 mm)	4" (10 cm)	White
U-117	0.030" (0.75 mm)	8" (20 cm)	White
U-118	0.030" (0.75 mm)	12" (30 cm)	White
U-136	0.030" (0.75 mm)	1.6' (50 cm)	White
U-137	0.030" (0.75 mm)	3.2' (1 m)	White
★ U-107	0.030" (0.75 mm)	5' (1.5 m)*	White
★ U-164	0.030" (0.75 mm)	25' (7.6 m)*	White
U-138	0.040" (1.0 mm)	2" (5 cm)	N/A
U-139	0.040" (1.0 mm)	4" (10 cm)	N/A
U-140	0.040" (1.0 mm)	8" (20 cm)	N/A
U-141	0.040" (1.0 mm)	12" (30 cm)	N/A
U-142	0.040" (1.0 mm)	1.6' (50 cm)	N/A
U-143	0.040" (1.0 mm)	3.2' (1 m)	N/A
U-144	0.040" (1.0 mm)	5' (1.5 m)	N/A
★ U-165	0.040" (1.0 mm)	25' (7.6 m)	N/A
U-145	0.046" (1.15 mm)	2" (5 cm)	N/A
U-146	0.046" (1.15 mm)	4" (10 cm)	N/A
U-147	0.046" (1.15 mm)	8" (20 cm)	N/A
U-148	0.046" (1.15 mm)	12" (30 cm)	N/A
U-149	0.046" (1.15 mm)	1.6' (50 cm)	N/A
U-150	0.046" (1.15 mm)	3.2' (1 m)	N/A
U-151	0.046" (1.15 mm)	5' (1.5 m)	N/A
IDEX PRECUT STAINLESS STEEL, 1/8" OD			
U-815	0.080" (2.0 mm)	6" (15 cm)	N/A
U-825	0.080" (2.0 mm)	10" (25 cm)	N/A
U-800	0.080" (2.0 mm)	3.2' (1 m)	N/A
U-803	0.080" (2.0 mm)	9.8' (3 m)	N/A
U-805	0.080" (2.0 mm)	16' (5 m)	N/A

*All Stainless Steel tubing longer than 1 m is coiled.

Typical tolerances: ± 0.001" (25 µm) for 1/16" OD tubing
± 0.003" (75 µm) for 1/8" OD tubing

VICI Precut Stainless Steel Tubing

These packages of pre-cut Type 316 stainless tubing provide an economical solution to the problems that are caused by "seat-of-the-pants" cutting in the lab or field. They are priced to give a savings over the charge for custom-cut tubing.

All tubing is electrolytically cut and specially steam-cleaned with micro-filtered steam from deionized water, which removes both organic and inorganic contaminants.

VICI Custom Length Tubing

Bulk metal tubing is not electrolytically cut or cleaned. The annealing process provides tubing which is sufficiently clean for most chromatography applications. Specify the length required, in inches or feet. For pricing of custom tubing, the length is rounded up to the next foot. For example, a 5" piece is charged as 1 foot; an 18" piece as 2 feet. Please call sales at Chrom Tech for custom orders.

VICI 316 STAINLESS STEEL SPECIFICATIONS

OD	PRESSURE RATING	OD TOLERANCE	ID TOLERANCE
1/32"	5800 PSI (400 bar)	± 0.05 mm (.002")	± 0.025 mm (.001")
1/16"	5300 PSI (365 bar)	± 0.05 mm (.002")	± 0.025 mm (.001")
1/8"	4600 PSI (315 bar)	± 0.05 mm (.002")	± 0.025 mm (.001")

Tubing sold by Valco has a typical ID tolerance of ±.001". This is much tighter than normal commercial grades of tubing; however, it is enough to result in noticeable error if exact volumes are not measured.

VICI 316 STAINLESS STEEL CUSTOM LENGTH TUBING

PART NO	ID
VICI 316 STAINLESS STEEL CUSTOM LENGTH, 1/32" OD	
TSS.505	0.005" (0.125 mm)
TSS.507	0.007" (0.175 mm)
TSS.510	0.010" (0.25 mm)
TSS.520	0.020" (0.5 mm)
VICI 316 STAINLESS STEEL CUSTOM LENGTH, 1/16" OD	
TSS104	0.004" (0.100 mm)
TSS105	0.005" (0.125 mm)
TSS107	0.007" (0.175 mm)
TSS110	0.010" (0.25 mm)
TSS115	0.015" (0.40 mm)
TSS120	0.020" (0.5 mm)
TSS126	0.026" (0.70 mm)
TSS130	0.030" (0.75 mm)
TSS140	0.040" (1.0 mm)
TSS150	0.050" (1.25 mm)
VICI 316 STAINLESS STEEL CUSTOM LENGTH, 1/8" OD	
TSS230	0.030" (0.75 mm)
TSS240	0.040" (1.0 mm)
TSS260	0.060" (1.5 mm)
TSS267	0.067" (1.70 mm)
TSS285	0.085" (2.15 mm)

VICI PRECUT STAINLESS STEEL (2/PK), 1/32" OD

PART NO	ID	LENGTH
VICI PRECUT STAINLESS STEEL (2/PK), 1/32" OD		
T5N5D	0.005" (0.125 mm)	2" (5 cm)
T10N5D	0.005" (0.125 mm)	4" (10 cm)
T20N5D	0.005" (0.125 mm)	8" (20 cm)
T30N5D	0.005" (0.125 mm)	12" (30 cm)
T50N5D	0.005" (0.125 mm)	1.6' (50 cm)
T100N5D	0.005" (0.125 mm)	3.2' (1 m)
T5N10D	0.010" (0.25 mm)	2" (5 cm)
T10N10D	0.010" (0.25 mm)	4" (10 cm)
T20N10D	0.010" (0.25 mm)	8" (20 cm)
T30N10D	0.010" (0.25 mm)	12" (30 cm)
T50N10D	0.010" (0.25 mm)	1.6' (50 cm)
T100N10D	0.010" (0.25 mm)	3.2' (1 m)
T5N20D	0.020" (0.5 mm)	2" (5 cm)
T10N20D	0.020" (0.5 mm)	4" (10 cm)
T20N20D	0.020" (0.5 mm)	8" (20 cm)
T30N20D	0.020" (0.5 mm)	12" (30 cm)
T50N20D	0.020" (0.5 mm)	1.6' (50 cm)
T100N20D	0.020" (0.5 mm)	3.2' (1 m)

VICI PRECUT STAINLESS STEEL (2/PK), 1/16" OD

T5C5D	0.005" (0.125 mm)	2" (5 cm)
T10C5D	0.005" (0.125 mm)	4" (10 cm)
T20C5D	0.005" (0.125 mm)	8" (20 cm)
T30C5D	0.005" (0.125 mm)	12" (30 cm)
T50C5D	0.005" (0.125 mm)	1.6' (50 cm)
T100C5D	0.005" (0.125 mm)	3.2' (1 m)
T5C10D	0.010" (0.25 mm)	2" (5 cm)
T10C10D	0.010" (0.25 mm)	4" (10 cm)
T20C10D	0.010" (0.25 mm)	8" (20 cm)
T30C10D	0.010" (0.25 mm)	12" (30 cm)
T50C10D	0.010" (0.25 mm)	1.6' (50 cm)
T100C10D	0.010" (0.25 mm)	3.2' (1 m)
T5C20D	0.020" (0.5 mm)	2" (5 cm)
T10C20D	0.020" (0.5 mm)	4" (10 cm)
T20C20D	0.020" (0.5 mm)	8" (20 cm)
T30C20D	0.020" (0.5 mm)	12" (30 cm)
T50C20D	0.020" (0.5 mm)	1.6' (50 cm)
T100C20D	0.020" (0.5 mm)	3.2' (1 m)
T5C30D	0.030" (0.75 mm)	2" (5 cm)
T10C30D	0.030" (0.75 mm)	4" (10 cm)
T20C30D	0.030" (0.75 mm)	8" (20 cm)
T30C30D	0.030" (0.75 mm)	12" (30 cm)
T50C30D	0.030" (0.75 mm)	1.6' (50 cm)
T100C30D	0.030" (0.75 mm)	3.2' (1 m)
T5C40D	0.040" (1.0 mm)	2" (5 cm)
T10C40D	0.040" (1.0 mm)	4" (10 cm)
T20C40D	0.040" (1.0 mm)	8" (20 cm)
T30C40D	0.040" (1.0 mm)	12" (30 cm)
T50C40D	0.040" (1.0 mm)	1.6' (50 cm)
T100C40D	0.040" (1.0 mm)	3.2' (1 m)

Tubing Cutters

Tube Cut-Off Machine, TC-20

The Model TC-20 Tube Cutter assures a zero dead volume connection. Tubing is held securely in a clamp vise on the vertical swing arm, producing a square cut with a finished end when the swing arm is lowered against the abrasive cutting wheel. No lubricant or cutting fluid is required. The TC-20 produces smooth cuts, dressed without distortions, on 1/16", 1/8", and 1/4" outside diameter tubing with inside diameters as small as 0.008".

The precision-ground dressing tool for 1/16" O.D. tubing is included and is attached directly to the swing arm so it cannot be misplaced or lost. The dressing tool can be ordered and used separately from the tube cut-off machine. The tool for 1/8" and 1/4" is optional.



100200
for 1/16", 1/8", and 1/4" OD tubing

TC-20 TUBE CUT-OFF MACHINE		
PART NO	DESCRIPTION	QTY
100200	Model TC-20*, 120 or 240 Volts, 50-60 Hz	ea
10-0124	Replacement cutting wheels	3/pk
10-0116	Dressing tool for 1/16" tubing	ea
10-1016	Needle insert for 1/16" dressing tool	ea
10-0118	Dressing tool for 1/8" tubing	ea
10-1018	Needle insert for 1/8" tubing	ea

*Includes dressing tool for 1/16" OD tubing

SPECIFICATIONS

Cutter Type:	Dry abrasive tool
Dressing Tool:	Precision ground and aligned hard tool set
Dimensions:	8" x 6.25" x 4.25" (20.5 x 16 x 11 cm)
Weight:	11 lbs (4.9 kg)

A dressing tool should be replaced when it gets dull and pushes rather than shaves burrs. The needle insert that deburrs the ID will break or wear out more frequently than the body that deburrs the OD. To replace the dressing tool, follow the Instructions below.

1. Remove the dressing tool from the vise arm by opening the C-ring. The needle insert is held inside the tool body by a set screw.
2. Note the position of the needle Insert cutting tip before loosening the set screw. Remove and replace the needle to the same position. Normally the back of the insert will be flush with the back of the tool body.
3. Tighten the set screw, replace the dressing tool and C-ring

Manual Tubing Cutters

TUBING CUTTERS				
PART NO	DESCRIPTION	CUTS TUBING OD	INCLUDES	QTY
★ TT-1001	Terry Tool	Cuts 1/16" OD tubing	TT-1003	ea
★ TT-1008	Terry Tool	Cuts 1/8" OD tubing	TT-1003	ea
TT-1003	Terry Tool	Replacement cutting wheels		3/pk
TC-1017	Pliers style	Cuts 1/16" OD tubing		ea

★ **TOP SELLER!**



TT-1001



TC-1017

Operation for Terry Tool Tubing Cutter (1/16" OD Tubing)

- ➔ Tubing is placed in 1/16" V groove of Terry Tool locking arm.
- ➔ Position locking arm so that tubing is locked against the cutter wheel.
- ➔ Rotate Terry Tool about the tubing axis until the noticeable resistance has released and an almost free wheel of the cutter is experienced.
- ➔ Remove tubing from the Terry Tool and apply slight pressure at both sides of the cut groove. Tubing should easily snap.
- ➔ Your Terry Tool tubing cutter has been adjusted* to cut .020" ID

*For use with smaller ID tubing, turn the allen head adjusting the screw approximately 1/8 to 1/4 turn counter-clockwise. This allows a deeper cut in thicker wall tubing. For use with larger ID tubing, adjust the allen screw 1/8 to 1/4 turn in the clockwise direction.

TECH TIP

The Terry Tool cuts without deforming the tubing so nuts and ferrules slip on and no additional reaming or deburring is usually required

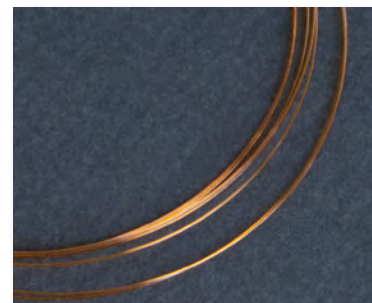


Fused Silica Tubing

These products are manufactured from synthetic fused silica with a polyimide coating.

CAPILLARY PEEK & FUSED SILICA TUBING

PART NO	ID	OD	LENGTH	COLOR	MAX PRESSURE
FS-120	0.0008" (20 µm)	360 µm	6.4' (2 m)	Natural	10,000 PSI (690 bar)
FS-150	0.002" (50 µm)	360 µm	6.4' (2 m)	Natural	10,000 PSI (690 bar)
FS-175	0.003" (75 µm)	360 µm	6.4' (2 m)	Natural	10,000 PSI (690 bar)
FS-115	0.006" (150 µm)	360 µm	6.4' (2 m)	Natural	10,000 PSI (690 bar)



Hastelloy C Custom Length Tubing

VICI HASTELLOY C CUSTOM LENGTH TUBING

PART NO	MAX PRESSURE (PSI)	ID	OD
THC110	13,300	0.010" (0.25 mm)	1/16"
THC120	10,700	0.020" (0.5 mm)	1/16"
THC130	8,000	0.030" (0.75 mm)	1/16"
THC140	5,300	0.040" (1.0 mm)	1/16"
THC270	10,000	0.070" (1.75 mm)	1/8"
THC285	10,000	0.085" (2.15 mm)	1/8"

Agilent Miscellaneous Capillaries

MISCELLANEOUS CAPILLARIES

PART NO	MATERIAL	ID (mm)	LENGTH (mm)	OD (mm) A*	OD (mm) B*	NOTES
5021-1820	SS	0.12	105	1/16"	1/16"	Capillary without fitting
5021-1823	SS	0.12	400	1/16"	1/16"	Capillary without fitting
5021-1821	SS	0.12	150	1/16"	1/16"	Capillary without fitting
5021-1822	SS	0.12	280	1/16"	1/16"	Capillary without fitting
5065-9964	SS	0.12	500	1/16"	1/16"	Capillary without fitting
5065-9935	SS	0.12	200	1/16"	1/16"	Capillary without fitting
5021-1816	SS	0.17	105	1/16"	1/16"	Capillary without fitting
5021-1819	SS	0.17	400	1/16"	1/16"	Capillary without fitting
5021-1817	SS	0.17	150	1/16"	1/16"	Capillary without fitting
5021-1818	SS	0.17	280	1/16"	1/16"	Capillary without fitting
5065-9931	SS	0.17	200	1/16"	1/16"	Capillary without fitting
5065-9933	SS	0.17	600	1/16"	1/16"	Capillary without fitting
5065-9963	SS	0.17	900	1/16"	1/16"	Capillary without fitting
5065-9932	SS	0.17	700	1/16"	1/16"	Capillary without fitting



(Shown with fitting – not included)

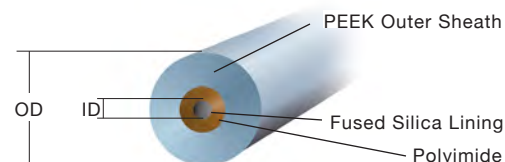
PEEKsil™ Tubing

- ➔ PEEK covered fused silica
- ➔ 1/32" and 1/16" outside diameters with a wide variety of inside diameters
- ➔ Precut to numerous standard lengths

PEEKsil's sheathing is mechanically strong and has ideal characteristics for sealing with many styles of fittings. The fused silica core provides a consistent and rigid fluid pathway with very tight tolerances and industry-accepted chemical properties. Together, this makes PEEKsil tubing ideal for numerous applications. In fact, PEEKsil can be used as a direct replacement for conventional stainless steel or PEEK tubing in many analytical systems.

Like traditional fused silica tubing, PEEKsil has excellent chemical compatibility and extremely low adsorption characteristics, especially when compared with stainless steel.

Please Note: **Do not cut this tubing.** It should be used at its precut lengths because of permanent damage caused by cutters.



PEEKsil™ TUBING				
PART NO	ID	LENGTH	COLOR	QTY
PEEKsil TUBING, 1/32" OD				
3255	0.001" (25 µm)	2" (5 cm)	Orange	2/pk
32510	0.001" (25 µm)	4" (10 cm)	Orange	2/pk
32515	0.001" (25 µm)	6" (15 cm)	Orange	2/pk
32520	0.001" (25 µm)	10" (25 cm)	Orange	2/pk
32550	0.001" (25 µm)	1.6' (50 cm)	Orange	2/pk
3505	0.002" (50 µm)	2" (5 cm)	Natural	2/pk
35010	0.002" (50 µm)	4" (10 cm)	Natural	2/pk
35015	0.002" (50 µm)	6" (15 cm)	Natural	2/pk
35020	0.002" (50 µm)	10" (25 cm)	Natural	2/pk
35050	0.002" (50 µm)	1.6' (50 cm)	Natural	2/pk
3755	0.003" (75 µm)	2" (5 cm)	Black	2/pk
37510	0.003" (75 µm)	4" (10 cm)	Black	2/pk
37515	0.003" (75 µm)	6" (15 cm)	Black	2/pk
37520	0.003" (75 µm)	10" (25 cm)	Black	2/pk
37550	0.003" (75 µm)	1.6' (50 cm)	Black	2/pk
31005	0.004" (100 µm)	2" (5 cm)	Red	2/pk
310010	0.004" (100 µm)	4" (10 cm)	Red	2/pk
310015	0.004" (100 µm)	6" (15 cm)	Red	2/pk
310020	0.004" (100 µm)	10" (25 cm)	Red	2/pk
310050	0.004" (100 µm)	1.6' (50 cm)	Red	2/pk
31505	0.006" (150 µm)	2" (5 cm)	Purple	2/pk
315010	0.006" (150 µm)	4" (10 cm)	Purple	2/pk
315015	0.006" (150 µm)	6" (15 cm)	Purple	2/pk
315020	0.006" (150 µm)	10" (25 cm)	Purple	2/pk
315050	0.006" (150 µm)	1.6' (50 cm)	Purple	2/pk

PEEKsil™ TUBING				
PART NO	ID	LENGTH	COLOR	QTY
PEEKsil TUBING, 1/16" OD				
6255	0.001" (25 µm)	2" (5 cm)	Orange	5/pk
62510	0.001" (25 µm)	4" (10 cm)	Orange	5/pk
62515	0.001" (25 µm)	6" (15 cm)	Orange	5/pk
62520	0.001" (25 µm)	10" (25 cm)	Orange	5/pk
62550	0.001" (25 µm)	1.6' (50 cm)	Orange	2/pk
6505	0.002" (50 µm)	2" (5 cm)	Natural	5/pk
65010	0.002" (50 µm)	4" (10 cm)	Natural	5/pk
65015	0.002" (50 µm)	6" (15 cm)	Natural	5/pk
65020	0.002" (50 µm)	10" (25 cm)	Natural	5/pk
65050	0.002" (50 µm)	1.6' (50 cm)	Natural	2/pk
6755	0.003" (75 µm)	2" (5 cm)	Black	5/pk
67510	0.003" (75 µm)	4" (10 cm)	Black	5/pk
67515	0.003" (75 µm)	6" (15 cm)	Black	5/pk
67520	0.003" (75 µm)	10" (25 cm)	Black	5/pk
67550	0.003" (75 µm)	1.6' (50 cm)	Black	2/pk
61005	0.004" (100 µm)	2" (5 cm)	Red	5/pk
610010	0.004" (100 µm)	4" (10 cm)	Red	5/pk
610015	0.004" (100 µm)	6" (15 cm)	Red	5/pk
610020	0.004" (100 µm)	10" (25 cm)	Red	5/pk
610050	0.004" (100 µm)	1.6' (50 cm)	Red	2/pk
61505	0.006" (150 µm)	2" (5 cm)	Purple	5/pk
615010	0.006" (150 µm)	4" (10 cm)	Purple	5/pk
615015	0.006" (150 µm)	6" (15 cm)	Purple	5/pk
615020	0.006" (150 µm)	10" (25 cm)	Purple	5/pk
615050	0.006" (150 µm)	1.6' (50 cm)	Purple	2/pk
617510	0.007" (175 µm)	4" (10 cm)	Yellow	5/pk
617520	0.007" (175 µm)	10" (25 cm)	Yellow	5/pk
617550	0.007" (175 µm)	1.6' (50 cm)	Yellow	2/pk
62005	0.008" (200 µm)	2" (5 cm)	Blue	5/pk
620010	0.008" (200 µm)	4" (10 cm)	Blue	5/pk
620015	0.008" (200 µm)	6" (15 cm)	Blue	5/pk
620020	0.008" (200 µm)	10" (25 cm)	Blue	5/pk
620050	0.008" (200 µm)	1.6' (50 cm)	Blue	2/pk
63005	0.012" (300 µm)	2" (5 cm)	Gray	5/pk
630010	0.012" (300 µm)	4" (10 cm)	Gray	5/pk
630015	0.012" (300 µm)	6" (15 cm)	Gray	5/pk
630020	0.012" (300 µm)	10" (25 cm)	Gray	5/pk
630050	0.012" (300 µm)	1.6' (50 cm)	Gray	2/pk

Chrom Tech Solvent Waste Container System Kit

System includes a Justrite Safety Container (2 or 5 gallon) with 2 Quick Connects and the following accessories:

- ➔ Reusable Filter Adapter 1/16" OD (Qty 2)
- ➔ Organic Vapor Filter 1/8" OD (Qty 2)
- ➔ 6 Port Waste Manifold 1/4" ID (Qty 2)
- ➔ Tubing Connection Kit
Plugs to close off any unused ports (Qty 4)



CHROM TECH SOLVENT WASTE CONTAINER COMPLETE SYSTEM KIT

PART NO	DESCRIPTION
SAFETY-2PP	2 gal PP Solvent Waste Containment System, complete with: JT-PP12752, MA-601, EF-100, FA-010 and connections
SAFETY-5PP	5 gal PP Solvent Waste Containment System, complete with: JT-PP12755, MA-601, EF-100, FA-010 and connections
SAFETY-2SS	2 gal Stainless Steel Solvent Waste Containment System, complete with: JT-TF12752, MA-603, EF-100, FA-015 and connections
SAFETY-5SS	5 gal Stainless Steel Solvent Waste Containment System, complete with: JT-TF12755, MA-603, EF-100, FA-015 and connections

REPLACEMENT PARTS & ACCESSORIES FOR CHROM TECH SOLVENT WASTE CONTAINER SYSTEM KIT

SAFETY DISPOSAL CANS					
PART NO	DESCRIPTION & CAPACITY	DIMENSIONS	FITTINGS	O-RING	TUBING*
JT-12160	1 gal Polyethylene Safety Disposal Can, PP fittings, EPDM O-ring	5.25" W x 12.75" H x 7.75" D	PP	EPDM	3/8"
JT-PP12752	2 gal Polyethylene Safety Disposal Can, PP fittings, EPDM O-ring	12" OD x 14.75" H	PP	EPDM	3/8"
JT-PP12755	5 gal Polyethylene Safety Disposal Can, PP fittings, EPDM O-ring	12" OD x 20" H	PP	EPDM	3/8"
JT-TF12752	2 gal Polyethylene Safety Disposal Can, SS fittings, PTFE O-ring	12" OD x 14.75" H	SS	PTFE	3/8"
JT-TF12755	5 gal Polyethylene Safety Disposal Can, SS fittings, PTFE O-ring	12" OD x 20" H	SS	PTFE	3/8"
JT-12752-CC1	2 gal (7.5L) Polyethylene Safety Disposal Can w/SS fitting suction option assy	12" OD x 14.75" H	PP	EPDM	3/8"
JT-12755-CC1	5 gal (19L) Polyethylene Safety Disposal Can w/SS fitting suction option assy	12" OD x 20" H	PP	EPDM	3/8"

WASTE MANIFOLD	
MA-601	6-Port Polypropylene Waste Manifold (5) 1/4" NPT, (1) 1/2" NPT, w/ PP, EPDM
MA-603	6-Port Polypropylene Waste Manifold (5) 1/4" NPT, (1) 1/2" NPT, w/ SS/PTFE

ORGANIC VAPOR FILTERS & FILTER ADAPTERS	
EF-100	Organic Vapor Filter, ea
EF-100V	Organic Vapor Filters, 5/pk
EF-102	Color Indicator for organic vapor filters, ea
EF-102V	Color Indicator for organic vapor filters, 5/pk
FA-010	Justrite Can Adapter, EPDM, PP
FA-015	Justrite Can Adapter, SS, PTFE
FA-017	Justrite Can Adapter Elbow, EPDM, PP
FA-019	Justrite Can Adapter Elbow, SS, PTFE

TUBING CONNECTIONS & PLUGS	
AB-114	Barbed Tubing Connection, 1/4" ID, 1/4" NPT, PP
AB-204	Barbed Tubing Connection, 1/4" ID, 1/2" NPT, PP
AC-150	Tubing Connection, 1/16" OD, 1/4" NPT, PP
AC-151	Tubing Connection, 1.8 – 2.0 mm OD, 1/4" NPT, PP
AC-155	Tubing Connection, 1/8" OD, 1/4" NPT PP
PL-101	Plug, 1/4" NPT, PP
PL-102	Plug, 1/2" NPT, PP



See NPT Fittings (pg 226)

*Tubing is not supplied with individual containers

Accessories

Vertical Drum Polyethylene Pop-up Gauge is a low cost solution to overfilling drums during waste disposal operations. When drum is almost full, indicator "pops-up" to warn you.

Antistatic Wires prevent sparks from static electricity generated by movement and flow of flammable liquids. Bonding between containers during liquid transfer, and connecting drums to an earth ground are required under Federal and Local Codes.

Safety Funnels adapt to CPL safety Eco Funnels to allow quick disposal of pourable solvent waste. Locking, hinged lid minimizes leaks and spills when the funnel is closed.

JT-TF12755 Container
JT-84003 Spill Basin



SF-003



JT-08500



JT-08530



SOLVENT CONTAINMENT ACCESSORIES

PART NO	DESCRIPTION	DIMENSIONS
JT-84003	HPLC Can Spill Basin w/5 gal (19L) Spill Capacity, Polyethylene	7.63" H x 14.88" W x 14.88" D (194 x 379 x 379 mm)
JT-08530	Vertical Drum Polyethylene Pop-up Gauge	3/4" dia—5"L (127 mm)
JT-08500	Antistatic Flexible Wire, 3' (1 m)	Dual Alligator Clips 5/8" (16 mm)
SF-003	Safety Waste Funnel with PP/EPDM disconnect	
SF-005	Safety Waste Funnel with SS/PTFE disconnect	

Justrite Quick-Disconnect Disposal Cans

Stainless Steel Fittings with polytetrafluoroethylene (PTFE) seals are the industry standard and offer superior chemical compatibility.

Polypropylene Fittings are an economical alternative with EPDM seals.

Suction Option Assembly: Internal 1/4" (6 mm) ID polytetrafluoroethylene (PTFE) tubing with stainless steel fitting is installed below disconnect (of your specification) to allow for safe dispensing of fluid out of the can. NOTE: must be used under suction only.

JT-PP12755



Cutaway View of Container



TECH TIP

Polypropylene quick-disconnect fittings are typically used with reverse phased solvents i.e. ACN, Methanol.

Stainless Steel/PTFE quick-disconnect fittings must be used with normal phase and GPC solvents i.e. Hexane, Heptane and THF.

Contact Chrom Tech Support Desk for recommendations—support@chromtech.com

Vaplock Chemical Emissions Filters and Adapters

- Minimize odors by adsorption before they enter the lab environment
- Constructed of activated coconut shell carbon and silica desiccant, with Polypropylene housing
- Economically priced

EF-100



EF-102



FA-017



TECH TIP

Use the elbow adapter to minimize overall height of waste containment system.

Vaplock Solvent Waste Manifolds for Justrite Safety Cans

- ➔ Collect solvent waste easily from various sources into Justrite® Centura™ quick-disconnect containers
- ➔ Manifolds fit almost any tubing size with use of the appropriate fitting
- ➔ Wide-bore Polypropylene (PP) or PTFE manifold design allows multiple tubing connections with high fluid flow

MA-601



VAPLOCK WASTE MANIFOLDS

PART NO	PORT QTY	PORT STYLE	MANIFOLD MATERIAL	DISCONNECT MATERIAL
MA-301	3	1/4" FNPT	Polypropylene	PP/EPDM
MA-601	6	(1) 1/2" FNPT, (5) 1/4" FNPT	Polypropylene	PP/EPDM
MA-701	7	(1) 1/4" FNPT, (6) 1/4-28 F	Polypropylene	PP/EPDM
MA-903	9	(1) 1/4" FNPT, (8) 1/4-28 F	PTFE	PP/EPDM
MA-1001	10	(1) 1/2" FNPT, (3) 1/4" FNPT, (6) 1/4-28 F	Polypropylene	PP/EPDM
MA-105	1	1/4" FNPT	SS/PTFE	SS/PTFE
MA-303	3	1/4" FNPT	Polypropylene	SS/PTFE
MA-603	6	(1) 1/2" FNPT, (5) 1/4" FNPT	Polypropylene	SS/PTFE
MA-703	7	(1) 1/4" FNPT, (6) 1/4-28 F	Polypropylene	SS/PTFE
MA-705	7	(1) 1/4" FNPT, (6) 1/4-28 F	PTFE	SS/PTFE
MA-902	9	(1) 1/4" FNPT, (6) 1/4-28 F	PTFE	SS/PTFE
MA-1003	10	(1) 1/2" FNPT, (3) 1/4" FNPT, (6) 1/4-28 F	Polypropylene	SS/PTFE

MANIFOLD STACK UNITS

PART NO	PORT QTY	PORT STYLE	MANIFOLD MATERIAL	STACK CONNECTION
MA-300	3	(3) 1/4" FNPT	Polypropylene	1/4" MNPT
MA-304	3	(3) 1/4" FNPT	Polypropylene	1/2" MNPT
MA-600	6	(5) 1/4" FNPT, (1) 1/2" FNPT	Polypropylene	1/2" MNPT
MA-700	7	(1) 1/4" FNPT, (6) 1/4-28 F	Polypropylene	1/4" MNPT
MA-704	7	(1) 1/4" FNPT, (6) 1/4-28 F	Polypropylene	1/2" MNPT
MA-706	7	(1) 1/4" FNPT, (6) 1/4-28 F	PTFE	1/4" MNPT
MA-900	9	(1) 1/4" FNPT, (8) 1/4-28 F	PTFE	1/4" MNPT
MA-904	9	(1) 1/4" FNPT, (8) 1/4-28 F	Polypropylene	1/2" MNPT
MA-1004	10	(1) 1/2" FNPT, (3) 1/4" FNPT, (6) 1/4-28 F	Polypropylene	1/2" MNPT

TECH TIP

Select a manifold for a Justrite can based on the type of disconnects on the container. For a Justrite can with Polypropylene and EPDM disconnects, for example, choose part number MA-601 (6-port).

Vaplock Manifold Stack Units

Increase the number of manifold ports by adding a manifold stack unit

MA-600



Popular Manifold Fittings & Tubing

POPULAR MANIFOLD FITTINGS & TUBING

PART NO	TUBING	THREAD	MATERIAL	COLOR	QTY
HARDWALL TUBING ADAPTERS					
AC-150	1/16" OD	1/4" NPT	Polypropylene, ETFE	Green	ea
XP-201	1/16" OD	1/4-28	Delrin, ETFE	Black, Blue	ea
AC-155	1/8" OD	1/4" NPT	Polypropylene, ETFE	Blue	ea
XP-301	1/8" OD	1/4-28	Delrin, ETFE	Black, Yellow	ea
BARBED SOFTWALL TUBING ADAPTERS					
AB-114X	1/4" ID	1/4" NPT	Polypropylene		10/pk
AB-204X	1/4" ID	1/2" NPT	Polypropylene		10/pk
SOFTWALL ADAPTER PLUGS FOR 1/4" AND 1/2" NPT PORTS					
PL-101X	Plug	1/4" NPT	Polypropylene		10/pk
PL-102X	Plug	1/2" NPT	Polypropylene		10/pk
TUBING *Lengths greater than 10' available. Specify length at time of order.					
T-10202	1/16" OD, 10'* length	-	FEP	Natural	ea
T-10201	1/8" OD, 10'* length	-	FEP	Natural	ea

AC-150



AC-155



See NPT Fittings (pg 226)
See 1/4-28" Flangeless Fittings (pg 220)

Vaplock Solvent Waste Manifold Caps for GL45, GL38 and 38-430

VAPLOCK SAFETY CAPS FOR SOLVENT WASTE

PART NO	PORT QTY	PORT STYLES	MANIFOLD MATERIAL
GL45 SOLVENT WASTE CAPS			
BC-324	3	1/4" NPT	PP w/expanded PTFE gasket and HDPE cap collar
BC-332	3	1/4" NPT	PTFE w/expanded PTFE gasket and HDPE cap collar
BC-622	6	(5) 1/4" NPT, (1) 1/2" NPT	PP manifold w/PTFE insert and gasket, PE collar
BC-722	7	(6) 1/4-28, (1) 1/4" NPT	PP manifold, PE collar
BC-723	7	(6) 1/4-28, (1) 1/4" NPT	PTFE manifold, insert and gasket, blue PP collar
SV-415	6	(4) 1/4-28, (2) 1/8" NPT	PTFE insert, PP spin collar
GL38 SOLVENT WASTE CAPS			
BC-326	3	1/4" NPT	PP
BC-620	6	(5) 1/4" NPT, (1) 1/2" NPT	PP
BC-629	6	(5) 1/4" NPT, (1) 1/2" NPT	PTFE
BC-720	7	(6) 1/4-28, (1) 1/4" NPT	PP manifold w/PTFE insert and gasket
BC-724	7	(6) 1/4-28, (1) 1/4" NPT	PTFE manifold, insert and gasket
NALGENE 38-430 MANIFOLD CAPS			
BC-350	3	1/4" NPT	PP
BC-640	3	(5) 1/4" NPT, (1) 1/2" NPT	PP

Additional safety caps are available upon request, please contact sales for options.

BC-723



BC-326



BC-720



Vaplock Solvent Waste Manifold Caps for Carboy Containers

VAPLOCK CARBOY MANIFOLDS

PART NO	CARBOY STYLE	PORT QTY	PORT STYLE	MANIFOLD	GASKET	ATTACHMENT TYPE
PM-608	51 mm	6	(1) 1/2" FNPT, (5) 1/4" FNPT	PP	EPDM	Cam Lock, PP/EPDM
CM-303	53B Nalgene	3	1/4" FNPT	PP	EPDM	Cam Lock, PP/EPDM
CM-603	53B Nalgene	6	(1) 1/2" FNPT, (5) 1/4" FNPT	PP	EPDM	Cam Lock, PP/EPDM
SV-127	53B Nalgene	6	(1) 1/2" FNPT, (5) 1/4" FNPT	PP	Viton	Spin Collar
CM-903	53B Nalgene	9	(1) 1/4" FNPT, (8) 1/4-28 UNF	PTFE	EPDM	Cam Lock, PP/EPDM
PM-303	61 mm	3	1/4" FNPT	PP	EPDM	Cam Lock, PP/EPDM
PM-603	61 mm	6	(1) 1/2" FNPT, (5) 1/4" FNPT	PP	EPDM	Cam Lock, PP/EPDM
PM-304	63 mm	3	1/4" FNPT	PP	EPDM	Cam Lock, PP/EPDM
PM-604	63 mm	6	(1) 1/2" FNPT, (5) 1/4" FNPT	PP	EPDM	Cam Lock, PP/EPDM
PM-301	70 mm	3	1/4" FNPT	PP	EPDM	Cam Lock, PP/EPDM
PM-601	70 mm	6	(1) 1/2" FNPT, (5) 1/4" FNPT	PP	EPDM	Cam Lock, PP/EPDM
SV-165	70 mm Hedwin	7	(1) 1/4" FNPT, (6) 1/4-28 UNF	PP	XPTFE	Spin Collar
SV-165NAL	70 mm Nalgene	7	(1) 1/4" FNPT, (6) 1/4-28 UNF	PP	XPTFE	Spin Collar
CM-301	83B Nalgene	3	1/4" FNPT	PP	EPDM	Cam Lock, PP/EPDM
CM-601	83B Nalgene	6	(1) 1/2" FNPT, (5) 1/4" FNPT	PP	EPDM	Cam Lock, PP/EPDM
CM-901	83B Nalgene	9	(1) 1/4" FNPT, (8) 1/4-28 UNF	PTFE	EPDM	Cam Lock, PP/EPDM
SV-215	83B Nalgene	10	(1) 1/2" FNPT, (3) 1/4" FNPT, (6) 1/4-28 UNF	PP	EPDM	Spin Collar
CM-306	100-415 Nalgene	3	1/4" FNPT	PP	EPDM	Cam Lock, PP/EPDM
CM-606	100-415 Nalgene	6	(1) 1/2" FNPT, (5) 1/4" FNPT	PP	EPDM	Cam Lock, PP/EPDM
SV-225	100-415 Nalgene	10	(1) 1/2" FNPT, (3) 1/4" FNPT, (6) 1/4-28 UNF	PP	N/A	Spin Collar
PM-305	Panel Mount	3	1/4" FNPT	PP	EPDM	Cam Lock, PP/EPDM
PM-605	Panel Mount	6	(1) 1/2" FNPT, (5) 1/4" FNPT	PP	EPDM	Cam Lock, PP/EPDM

SV-127



SV-215



SV-225



TECH TIP

Panel mount manifolds may also be used if a nonstandard cap is present; either drill a 1.125" diameter hole (max 1/2" depth) in the cap and thread in place for a secure seal.

All Glass Filtration Assembly

→ All glass filtration apparatus—for HPLC solvent clean-up

Liquids come in contact only with borosilicate glass. Base design has integral vacuum connection located above filtrate drip to prevent contamination of vacuum line with droplets.

COMPLETE FILTRATION APPARATUS			
PART NO	DESCRIPTION	REPL FUNNEL	REPL FLASK
F-41064	All-Glass filter apparatus, 47 mm, 300 mL funnel and 1 L flask	F-410048	F-410644
F-41065	All-Glass filter apparatus, 47 mm, 500 mL funnel and 2 L flask	F-410056	F-410654
F-41066	All-Glass filter apparatus, 47 mm, 1 L funnel and 4 L flask	F-410666	F-410664
COMPLETE WITH SOLVENT PICKUP ADAPTER			
F-41084	Filter apparatus, 47 mm, 1 L flask, solvent pickup adapter	F-410048	F-410644
F-41085	Filter apparatus, 47 mm, 2 L flask, solvent pickup adapter	F-410056	F-410654
F-41086	Filter apparatus, 47 mm, 4 L flask, solvent pickup adapter	F-410666	F-410664
REPLACEMENT COMPONENTS			
F-226600	Solvent pickup adapter		
F-410642	Fritted glass support base, 40/35		
F-410052	Aluminum clamp, 47 mm		

TECH TIP

Units consist of a funnel, coarse porosity fritted glass filter support base with integral vacuum connection and a flask with inner joint. An aluminum clamp connects the funnel and support base, joints are 40/35. All components are compatible with Millipore and Kontes all glass filter apparatus.

Mobile Phase/Storage Bottles

MOBILE PHASE/STORAGE BOTTLES		
PART NO	DESCRIPTION	COLOR
219919-1	500 mL Wheaton Graduated bottle, no cap, GL45, ea	Clear
219820-1	1 L Wheaton Graduated bottle w/cap, 38-430, ea	Clear
219940-1	1 L Wheaton Safety coated graduated bottle w/cap, GL45, ea	Clear
219921-1	2L Wheaton Graduated bottle, no cap, GL45, ea	Clear
1517-9001	500 mL Specialty Bottle with Aspirator with 2mm stopcock	Clear



CHROM TECH RELATED PRODUCTS

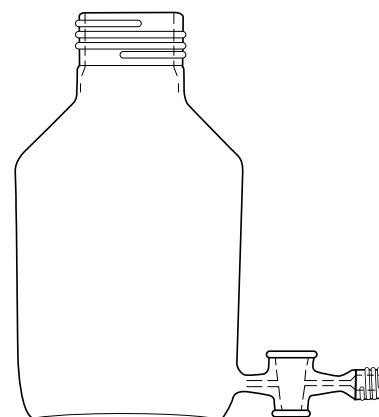


The new bottles feature an ergonomic design with a slimmer profile and ergonomically shaped gripping zones on both sides of the bottle, promoting easier and safer usage.

Agilent Solvent Reservoirs,
page 349



219820-1 219940-1

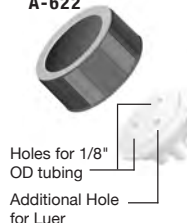


1517-9001

IDEX Bottle Caps

IDEX BOTTLE CAPS			
PART NO	PORT QTY	PORT STYLE	MATERIALS
IDEX GL38 BOTTLE CAPS			
A-622	3	(2) 1/8" OD Tubing (1) Luer Taper	PTFE, Polypropylene
IDEX GL45 BOTTLE CAPS			
A-620	3	(2) 1/8" OD Tubing (1) Luer Taper	PTFE, Polypropylene
IDEX PLUGS & ADAPTERS			
A-626		Bottle Cap Plug for luer hole, UHMWPE	
A-628		Bottle Cap Plug for 1/16", 1/8" or 3/16" hole, UHMWPE	
A-629		Filter Bottle Cap Plug for 1/16", 1/8" or 3/16" hole, UHMWPE with 20 µm stainless steel frit	

A-622



A-620



A-626



A-629



20 µm stainless steel frit

Vaplock Bottle Caps

VAPLOCK BOTTLE CAPS					
PORT QTY	PORT STYLE	MATERIALS	VAPLOCK GL45 BOTTLE CAPS	VAPLOCK GL38 BOTTLE CAPS	NALGENE 38-430 BOTTLE CAPS
2	1/4-28	PTFE insert w/collar	BC-222N	BC-220N	BC-240
2	1/4-28 Helicoil*	PTFE insert w/collar	BC-109	BC-106	—
3	1/4-28	PTFE insert w/collar	BC-322N	BC-320N	BC-340
3	1/4-28 Helicoil*	PTFE insert w/collar	BC-110	BC-107	—
4	1/4-28	PTFE insert w/collar	BC-422N	BC-420N	BC-440
4	1/4-28, Helicoil*	PTFE insert w/collar	BC-111	BC-108	—
GL45 CAPS WITH PTFE FILTER MEMBRANE AND AIR INLET VALVES					
2	1/4-28	PTFE w/yellow PP spin collar, FFKM	SV-305	—	—
2	1/4-28	PTFE w/green PP spin collar, EPDM	SV-305E	—	—
2	1/4-28	PTFE w/blue PP spin collar, Viton	SV-305V	—	—
4	1/4-28	PTFE w/yellow PP spin collar, FFKM	SV-306	—	—
4	1/4-28	PTFE w/green PP spin collar, EPDM	SV-306E	—	—
4	1/4-28	PTFE w/blue PP spin collar, Viton	SV-306V	—	—

* Helicoil stainless steel thread ports enables repeated connect and disconnect.



Vaplock Evaporation Control and Pressure Relief Valves

VAPLOCK EVAPORATION CONTROL VALVES				
AIR INLET VALVE	PRESSURE RELIEF VALVE	MATERIAL	APPROX. CRACKING PRESSURE	THREAD
DV-115	DV-118	PTFE w/Viton Seal	1 PSI	1/4-28 Male
DV-201	DV-202	PEEK w/ Perfluoroelastomer Seal	1 PSI	1/4-28 Male

TECH TIP

Minimize vapor loss from supply bottles with the DV-115 and DV-201.

DV-118 and DV-202 operate in reverse, allowing pressure relief.

Omnifit Q-Series Bottle Caps

- ➔ Anti-twist design
- ➔ Optional on-off valves to control individual fluid lines

OMNIFIT Q-SERIES BOTTLE CAPS				
PART NO W/VALVE	PART NO W/O VALVE	PORT QTY	PORT STYLE	MATERIALS
OMNIFIT Q-SERIES GL38 BOTTLE CAPS				
OM-938Q-2V	OM-938Q-2	2	1/4-28	PTFE body, glass-filled PP cap, PCTFE valve
OM-938Q-3V	OM-938Q-3	3	1/4-28	PTFE body, glass-filled PP cap, PCTFE valve
—	OM-938Q-4	4	1/4-28	PTFE body, glass-filled PP cap, PCTFE valve
OMNIFIT Q-SERIES GL45 BOTTLE CAPS				
OM-945Q-2V	OM-945Q-2	2	1/4-28	PTFE body, glass-filled PP cap, PCTFE valve
OM-945Q-3V	OM-945Q-3	3	1/4-28	PTFE body, glass-filled PP cap, PCTFE valve
OM-945Q-4V	OM-945Q-4	4	1/4-28	PTFE body, glass-filled PP cap, PCTFE valve



The Omnifit® Q-series anti-twist design allows the PTFE body to spin freely within the outer blue cap. The solid PTFE inner body provides the highest chemical inertness. Q-series caps can be used under vacuum or positive pressure.

Upchurch Scientific General Use Inlet Stainless Steel Solvent Filters

- ➔ Disposable
- ➔ General use and prep filters for higher flow applications

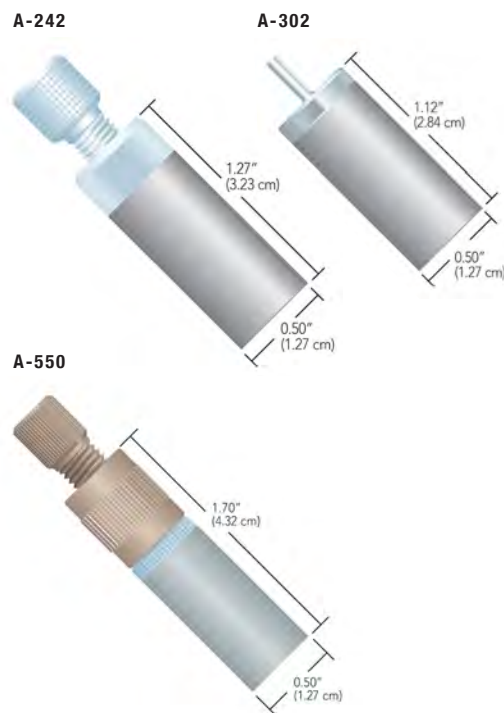
Filters should be changed periodically, therefore we make it easy to replace them without tools. For those filters using a plastic fitting, the tubing can be reconnected by finger tightening the fitting into the new filter. The filters with stems allow easy insertion into the inlet tubing.

Stainless Steel Bottom-of-the-Bottle™ Solvent Filters

- ➔ Replaceable stainless steel filter cups
- ➔ Draw solvent from within 1/8" of the bottom of your bottle

TECH TIP | Why Use An Inlet Solvent Filter

- ➔ To filter out particulate matter from the solvent that may otherwise damage expensive hardware. (Use a 10 µm or 20 µm for this purpose. The A-309 and A-230A filters have an added "Bottom of the Bottle™" feature to help draw solvent to within 1/8" of the bottom of your solvent bottle.
- ➔ To prevent particulates originating from the sparging system from entering the mobile phase reservoir and to help disperse the sparging gas efficiently. (Use a 2 µm filter for this purpose.)
- ➔ To hold your tubing in place at the bottom of the bottle. (Most stainless steel filter options work best for this purpose.)



IDEX SOLVENT FILTERS						
PART NO	DESCRIPTION	TUBING	POROSITY	FLOW RATE*	MATERIAL	INCLUDES
INLET SOLVENT FILTERS FOR ANALYTICAL HPLC						
A-242	Inlet-Solvent Filter with One-Piece Fitting	1/8" OD	2 µm	10 mL/min	PCTFE, 316 SS	(1) P-100
A-243	A-242, 5/pk	1/8" OD	2 µm	10 mL/min	PCTFE, 316 SS	(5) P-100
A-228	Inlet Solvent Filter with stem	1/8" ID	2 µm	80 mL/min	316 SS	—
A-302	Inlet Solvent Filter with stem	1/16" ID	10 µm	40 mL/min	316 SS	—
A-302A	Inlet Solvent Filter with Flangeless Fittings	1/8" OD	10 µm	40 mL/min	PCTFE, SSE	(1) XP-315
A-309	Inlet Solvent Filter with stem	1/16" ID	10 µm	40 mL/min	316 SS	—
A-231A	Inlet Solvent Filter with Flangeless Fittings	3/16" OD	20 µm	100 mL/min	PCTFE, 316 SS	(1) XP-132
A-310	Inlet Solvent Filter with stem	1/8" ID	10 µm	40 mL/min	316 SS	—
INLET SOLVENT FILTERS FOR PREPARATIVE HPLC SYSTEMS						
A-225	Inlet Solvent Filter with stem	1/16" ID	20 µm	100 mL/min	316 SS	—
A-225A	Inlet solvent Filter with Flangeless Fittings	1/8" OD	20 µm	100 mL/min	PCTFE, 316 SS	(1) P-315, (1) P-300N
A-227A	Inlet Solvent Filter with Flangeless Fittings	1/4" OD	10 µm	100 mL/min	PCTFE, 316 SS	(1) XU-655
A-230A	Inlet Solvent Filter with Flangeless Fittings	1/4" OD	20 µm	100 mL/min	PCTFE, 316 SS	(1) XU-655
A-311	Inlet Solvent Filter with stem	1/16" OD	10 µm	100 mL/min	316 SS	—
A-311A	Inlet Solvent Filter with Flangeless Fittings	1/8" OD	10 µm	100 mL/min	PCTFE, 316 SS	(1) XP-315
STAINLESS STEEL BOTTOM-OF-THE-BOTTLE SOLVENT FILTERS						
A-550	B.O.B. Filter Assembly with A-520 filter cup	1/8" OD	10 µm	40 mL/min	PEEK, ETFE, 316 SS	(1) XP-130
A-551	B.O.B. Filter Assembly with A-522 filter cup	1/8" OD	2 µm	10 mL/min	PEEK, ETFE, 316 SS	(1) XP-130
A-520X	Replacement Solvent Filter Cups, 10/pk	—	10 µm	40 mL/min	316 SS	—
A-522X	Replacement Solvent Filter Cups, 10/pk	—	2 µm	10 mL/min	316 SS	—

*Maximum suggested flow rates are determined by porosity and surface area

Agilent Glass Inlet Solvent Filters

AGILENT GLASS INLET SOLVENT FILTERS

PART NO	DESCRIPTION	TUBING	POROSITY	FLOW RATE*	MATERIAL	INCLUDES
5041-2168	Glass Inlet Solvent filter	1/8" OD	20 µm	10 mL/min	Glass	(1) 5062-8517

*Maximum suggested flow rates are determined by porosity and surface area

5041-2168



5062-8517

Filter frit adapters

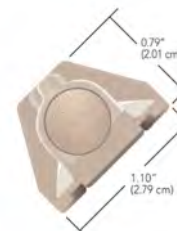


All-PEEK Bottom-of-the-Bottle Solvent Filters

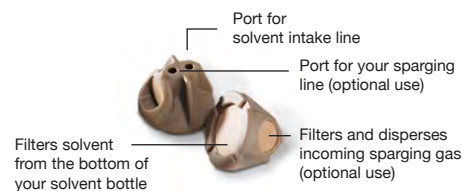
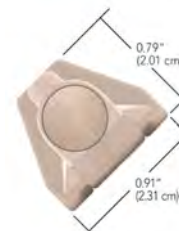
- ➔ Most recommended filtering unit
- ➔ Easy operation—no fittings required

These biocompatible filters are made from 100% PEEK polymer, including the two built-in PEEK frits. The bottom frit (2 µm or 10 µm) will draw solvents from within 0.080" (2.0 mm) of the bottom of the solvent bottle. The 2 µm frit on the side may be used for a 1/8" OD helium sparging line. To use simply press fit your appropriately sized fluoropolymer tubing firmly into the top holes. That's it!

A-435



A-438



ALL-PEEK BOTTOM-OF-THE-BOTTLE SOLVENT FILTERS

PART NO	DESCRIPTION	TUBING OD	POROSITY
A-435	PEEK Filter	1/8"	2 µm
A-437	PEEK Filter, for small-neck (GL-38) bottles	1/8"	2 µm
A-438	PEEK Filter, for small-neck (GL-38) bottles	1/8"	10 µm
A-440	PEEK Filter	1/8"	10 µm
A-441	PEEK Filter	3/16"	10 µm
A-451	PEEK Filter	1/16"	10 µm

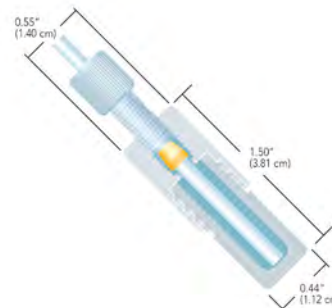
UHMWPE Bottom-of-the-Bottle Solvent Filters

- ➔ Replaceable filter cup
- ➔ Economical
- ➔ Materials of construction: UHMWPE, ETFE

The design of the UHMWPE solvent filters allows tubing to pass through to the bottom of the filter cup, enabling the filter to draw solvent from within 0.10" (2.5 mm) of the bottom of your solvent bottle.

Please Note: UHMWPE is a hydrophobic material. To establish proper surface wetting, you may need to prime the filter with methanol or acetonitrile.

A-446



UHMWPE BOTTOM-OF-THE-BOTTLE SOLVENT FILTERS

PART NO	DESCRIPTION	TUBING OD	POROSITY	INCLUDES
A-445	UHMWPE Filter Assembly	1/16"	10 µm	(1) XP-245
A-446	UHMWPE Filter Assembly	1/8"	10 µm	(1) XP-345
A-427	Replacement Solvent Filter Cups, 5/pk	—	10 µm	—

IDEX Injection Valves | Manual

IDEX MANUAL INJECTION VALVES

PART NO	DESCRIPTION	POS. SENSING SWITCH	MAX PSI	FITTING	FITS TUBING OD	WETTED MATERIAL	SAMPLE LOOP VOL
HIGH PRESSURE, ANALYTICAL (accepts a 22 gauge needle)							
★ 7725i	2-Position, 6-Port	Yes	6,000	10-32	1/16"	SST, Ceramic, Vespel	20 µL ¹
7725i-188	2-Position, 6 Port	Yes	9,000	10-32	1/16"	SST, PEEK, Ceramic	Front Loading
7725	2-Position, 6-Port	No	6,000	10-32	1/16"	SST, Ceramic, Vespel	20 µL ¹
9725i	2-Position, 6-Port	Yes	6,000	10-32	1/16"	PEEK, ETFE, Ceramic	20 µL ¹
9725	2-Position, 6-Port	No	6,000	10-32	1/16"	PEEK, ETFE, Ceramic	20 µL ¹
HIGH PRESSURE, PREPARATIVE (accepts a 16 gauge needle)							
3725-038	2-Position, 6-Port, Dual Mode	No	6,000	5/16-24	1/8"	SST, PEEK	10 mL ¹
3725i	2-Position, 6-Port, Dual Mode	Yes	6,000	5/16-24	1/8"	PEEK	10 mL ¹
3725i-038	2-Position, 6-Port, Dual Mode	Yes	6,000	5/16-24	1/8"	SST, PEEK	10 mL ¹
MEDIUM PRESSURE (in order to accept needle, requires P-295 see below)							
V-450 ²	2-Position, 6-Port, 0.040" thru passage	No	1,000	1/4-28	1/16"	Polyimide, PTFE	sold separately ⁴
V-451 ²	2-Position, 6-Port, Bulkhead Version	No	1,000	1/4-28	1/16"	Polyimide, PTFE	sold separately ⁴
V-540 ³	2-Position, 6-Port, 0.063" thru passage	No	1,000	1/4-28	1/8"	Polyimide, PTFE	sold separately ⁴
V-541 ³	2-Position, 6-Port, Bulkhead Version	No	1,000	1/4-28	1/8"	Polyimide, PTFE	sold separately ⁴

1) Ships with a sample loop attached to ports 1 and 4

2) Includes (6) XP-235, See "Upchurch Scientific Flangeless Fittings..." on pg 220

3) Includes (6) XP-335, See "Upchurch Scientific Flangeless Fittings..." on pg 220

4) See "IDEX Sample Loops" on pg 271

★ TOP SELLER!



7725i-188



V-540

TECH TIP

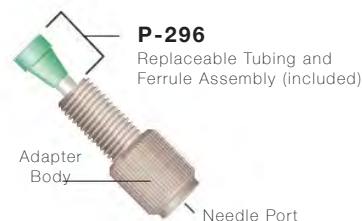
A **Dual Mode** Injection Valve allows either partial or complete filling of the loop, and introduces sample by syringe through the needle port built into the valve shaft. Complete filling of the sample loop provides greater repeatability, injection to injection. **Bulkhead** Injection Valves utilize the mounting bracket M-615-2, found on pg 278.

1/4-28 Flat-Bottom Injection Port Adapter

This simple, biocompatible adapter is designed specifically for the Upchurch Scientific Injection Valves and can also convert any 1/4-28 flat-bottom port into a port that can accept a standard 22 gauge HPLC injection needle. This injection port adapter is adjustable, so you can create a snug fit around the needle to prevent any leaking of the analyte. In addition, this product features an internal stop that prevents you from inserting the needle too far, eliminating the possibility of damaging the valve with the needle tip.

P-295

1/4-28 Flat-Bottom Injection Port Adapter



P-296

Replaceable Tubing and Ferrule Assembly (included)

1/4-28 FLAT-BOTTOM INJECTION PORT ADAPTER

PART NO	DESCRIPTION
P-295	Adjustable Injection Port Adapter, accepts a 22 gauge needle
P-296	Replacement Tubing/Ferrule Assembly

IDEX Injection Valves | Actuated

IDEX ACTUATED INJECTION VALVES

PART NO	DESCRIPTION	MAX PSI	FITTING	FITS TUBING OD	WETTED MATERIAL
HIGH PRESSURE INJECTION VALVES					
MXP7920-000	2-Position, 6-Port, Vertical Port	6,000	10-32	1/16"	DuraLife*

*DuraLife is a proprietary material combination of SST and an advanced polymer.



MX units are stackable

IDEX Sample Loops

IDEX STAINLESS STEEL SAMPLE LOOPS

PART NO	VOLUME	BORE ID	TUBING OD
RHEODYNE® STAINLESS STEEL LOOPS FOR MXT715-000			
7755-300	5 µL	0.18 mm (0.007")	1/16"
RHEODYNE STAINLESS STEEL LOOPS FOR 7125, 7010 INJECTION VALVES (DO NOT USE FOR 7725)			
7020	5 µL	0.18 mm (0.007")	1/16"
7021	10 µL	0.30 mm (0.012")	1/16"
7022	20 µL	0.51 mm (0.021")	1/16"
7023	50 µL	0.51 mm (0.021")	1/16"
7024	100 µL	0.51 mm (0.021")	1/16"
7025	200 µL	0.76 mm (0.030")	1/16"
7026	500 µL	0.76 mm (0.030")	1/16"
7027	1.0 mL	0.76 mm (0.030")	1/16"
7028	2.0 mL	1.0 mm (0.040")	1/16"
7029	5.0 mL	1.0 mm (0.040")	1/16"
1876	10 mL	2.0 mm (0.080")	1/8"
1877	20 mL	2.0 mm (0.080")	1/8"
RHEODYNE STAINLESS STEEL LOOPS FOR 3725-038, 3725I-038 INJ VALVES			
3065-018	2.0 mL	2.0 mm (0.080")	1/8"
3065-019	5.0 mL	2.0 mm (0.080")	1/8"
3065-023	10 mL	2.0 mm (0.080")	1/8"
3065-025	20 mL	2.0 mm (0.080")	1/8"
RHEODYNE STAINLESS STEEL LOOPS FOR 7725, 7725I, PR/EV700-100, PR/EV703-100, MX MODULE INJECTION VALVES (DO NOT USE FOR 7125)			
7755-020	5 µL	0.18 mm (0.007")	1/16"
7755-021	10 µL	0.30 mm (0.012")	1/16"
7755-022	20 µL	0.30 mm (0.012")	1/16"
7755-023	50 µL	0.51 mm (0.021")	1/16"
7755-024	100 µL	0.51 mm (0.021")	1/16"
7755-025	200 µL	0.76 mm (0.030")	1/16"
7755-026	500 µL	0.76 mm (0.030")	1/16"
7755-027	1.0 mL	0.76 mm (0.030")	1/16"
7755-028	2.0 mL	1.0 mm (0.040")	1/16"
7755-029	5.0 mL	1.0 mm (0.040")	1/16"
1876	10 mL	2.0 mm (0.080")	1/8"
1877	20 mL	2.0 mm (0.080")	1/8"

RHEODYNE STAINLESS STEEL LOOPS FOR 8125 INJECTOR (USE 7755-024 TO 7755-029 FOR VOLUMES > 50 µL)

PART NO	VOLUME	BORE ID	TUBING OD
8020	5 µL	0.20 mm (0.008")	0.020"
8021	10 µL	0.20 mm (0.008")	0.020"
8022	20 µL	0.25 mm (0.010")	0.020"
8023	50 µL	0.25 mm (0.010")	0.020"
8125-084	Ferrules for 0.020" (0.5 mm) Tubing		
8125-086	Ferrules for 0.020" (0.5 mm) Tubing 4/pk		

Accuracy of SS loop volume designations (due to tubing ID tolerance): 0.040" ID ± 5%; 0.020" ID ± 10%; and 0.007" ID ± 30%.

TECH TIP

3725 Series have the 5/16-24 Coned ports. Other Rheodyne valves have 10-32 Coned ports.

IDEX PEEK SAMPLE LOOPS

PART NO	VOLUME	BORE ID	TUBING OD
PEEK LOOPS FOR 3725, 3725I INJECTION VALVES			
3055-018	2.0 mL	1.6 mm (0.062")	1/8"
3055-019	5.0 mL	1.6 mm (0.062")	1/8"
3055-023	10 mL	2.0 mm (0.080")	1/8"
3055-025	20 mL	2.0 mm (0.080")	1/8"
PEEK LOOPS FOR 9725, 9010, PR/EV750-100, PR/EV753-100 INJ VALVES			
1800	2 µL	0.13 mm (0.005")	1/16"
9055-020	5.0 µL	0.18 mm (0.007")	1/16"
9055-021	10 µL	0.25 mm (0.010")	1/16"
9055-022	20 µL	0.25 mm (0.010")	1/16"
9055-023	50 µL	0.51 mm (0.021")	1/16"
9055-024	100 µL	0.51 mm (0.021")	1/16"
9055-025	200 µL	0.51 mm (0.021")	1/16"
9055-026	500 µL	0.76 mm (0.030")	1/16"
9055-027	1.0 mL	0.76 mm (0.030")	1/16"
9055-028	2.0 mL	0.76 mm (0.030")	1/16"
9055-029	5.0 mL	0.76 mm (0.030")	1/16"
9055-033	10 mL	0.76 mm (0.030")	1/16"

PEEK LOOPS FOR 7725, 7725I, PR/EV700-100

7123-227	1 µL	Internal groove (models PR/EV700-100, EV750-100 only)
7755-015	2 µL	Internal groove (models 7725, 7725I, and 9725(i) only)

Accuracy of PEEK loop volume designations (due to tubing ID tolerance): 0.030" ID ± 14%; 0.020" ID ± 21%; and 0.007" ID ± 65%. PEEK loops are supplied with unswaged RheFlex® fittings (see pg 224).



CHROM TECH RELATED PRODUCTS

RHEODYNE FITTINGS

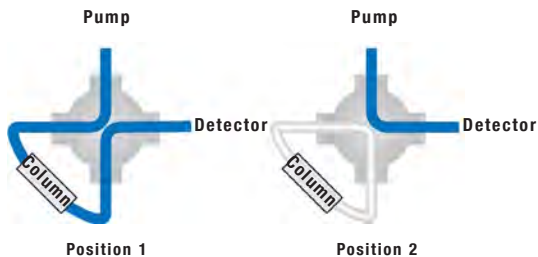
PART NO	DESCRIPTION	PORT	MATERIAL	QTY
6000-082	Fitting, 1/8" OD	5/16-24 Coned	SST	ea
6000-083	Ferrule, 1/8" OD	5/16-24 Coned	SST	5/pk
7010-011	Fitting, 1/16" OD, Long	10-32 Coned	SST	ea
6000-211	Fitting, 1/16" OD, Long	10-32 Coned	SST	10/pk
7010-010	Ferrule, 1/16" OD	10-32 Coned	SST	ea
6000-210	Ferrule, 1/16" OD	10-32 Coned	SST	10/pk
6000-078	Fitting, 1/8" OD	5/16-24 Coned	PEEK, Nat	ea
6000-079	Ferrule, 1/8" OD	5/16-24 Coned	PEEK, Nat	5/pk
6000-054	Fitting, 1/16" OD, Long	10-32 Coned	PEEK, Nat	5/pk
6000-254	Fitting, 1/16" OD, Long	10-32 Coned	PEEK, Nat	10/pk

ADAPTERS

6000-076	5/16-24 C, Male to 10-32 C, Female	PEEK	ea
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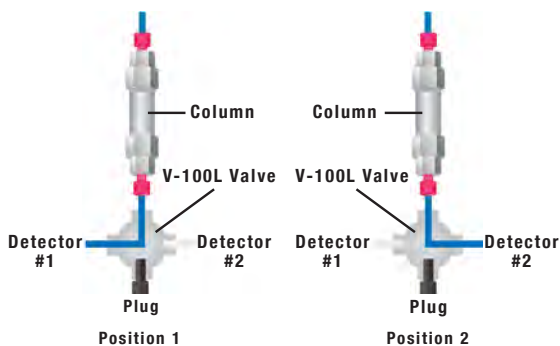
IDEX Switching Valves

Upchurch Scientific® Switching Valve Applications



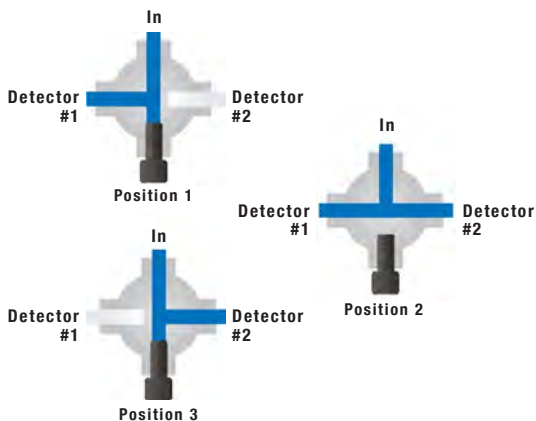
4-Way Diagonal Flow Switching Valves (V-100D, V-101D)

Protect sensitive system components (such as a column) during a cleaning cycle with our Diagonal Flow Switching Valve ("D"). This valve eliminates the need to remove, plug and reconnect a low pressure column



3-Way Flow Switching Valves (V-100T, V-101T)

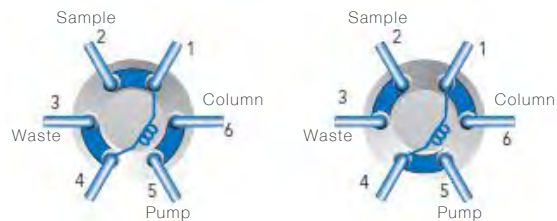
Your detector switching application may require the flexibility of routing the column effluent to both detectors simultaneously while retaining the ability to isolate each detector. Use our 3-Way Flow Switching Valve ("T"), plugging off the fourth port with the included plug.



Right Angle Flow Switching Valves (V-100L, V-101L)

A typical application for a Right Angle Flow Switching Valve ("L") is column switching, allowing two columns to use one detector. Detector switching is another common application for this valve Plug off the extra port with the included plug

Rhebuild Kits and Valve replacement parts are found on pages 276 – 277.



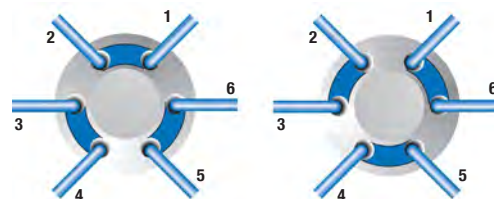
LOAD

INJECT

Flow path of Two-Position, Six-Port Injection Valve

Rheodyne® injection valves are a form of switching valve. Injection valves can be automated or manual, and they are generally utilized in the two-position, six-port (2/6) configuration and have a sample loop attached.

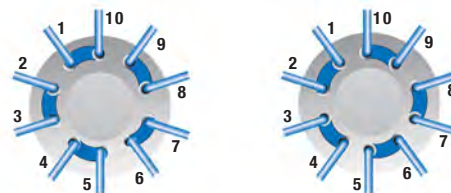
The purpose of an injection valve is to introduce a sample of a solution into a flowing stream of liquid. Some switching valves become Injection valves by the addition of a Sample Loop (a defined length of tubing and fittings configured to match the angle of the valve ports). Sample is loaded and held in the loop until injection is triggered, either manually or mechanically.



Position 1

Position 2

Flow path of Two-Position, Six-Port Switching Valve



Position 1

Position 2

Flow path of Two-Position, Ten-Port Switching Valve

Switching valves dynamically alternate between two fluid paths without manually disconnecting plumbing. In Chromatography, these valves can be used for column switching, backflushing, sample enrichment, and other techniques. In diagnostic or sequencing applications, the switching valve may alternate flow paths to enable back flushing or other fluidic tasks within the instrument.

IDEX Switching Valves | Manual

IDEX MANUAL SWITCHING VALVES							
PART NO	DESCRIPTION	MAX PSI	FITTING	FITS TUBING OD	WETTED MATERIAL	CONFIGURATION	
HIGH PRESSURE							
7000	2-Position, 6-Port, Large Bore	6,000	10-32	1/16"	SST & Vespel®	-	
7000L	2-Position, 6-Port, Large Bore	6,000	10-32	1/16"	SST & Vespel	-	
3000	2-Position, 6-Port, Prep Scale	6,000	5/16-24	1/8"	PEEK	-	
3030	2-Position, 6-Port, Prep Scale	6,000	5/16-24	1/8"	PEEK	Double 3-Way	
7030	2-Position, 6-Port	6,000	10-32	1/16"	SST & Vespel	Double 3-Way	
7030L	2-Position, 6-Port, Large Bore	6,000	10-32	1/16"	SST & Vespel	Double 3-Way	
MEDIUM PRESSURE							
V-100D ¹	4-Position, 4-Port	500	1/4-28	1/16"	PEEK, PTFE	Double Diagonal	
V-101D ¹	4-Position, 4-Port, Bulkhead	500	1/4-28	1/16"	PEEK, PTFE	Double Diagonal	
V-100L ²	4-Position, 4-Port	500	1/4-28	1/16"	PEEK, PTFE	Right-Angle "L"	
V-101L ²	4-Position, 4-Port, Bulkhead	500	1/4-28	1/16"	PEEK, PTFE	Right-Angle "L"	
V-100T ²	4-Position, 4-Port	500	1/4-28	1/16"	PEEK, PTFE	Single "T"	
V-101T ²	4-Position, 4-Port, Bulkhead	500	1/4-28	1/16"	PEEK, PTFE	Single "T"	

1) Includes (4) P-218BLK, (4) P-240

2) Includes (4) P-218BLK, (4) P-240, (1) P-309



7000
Manual Switching Valve



V-101L
Manual Switching Valve

TECH TIP

Bulkhead Switching Valves utilize the mounting bracket M-615-1, found on pg 278.

Switching Valves | Actuated

IDEX ACTUATED SWITCHING VALVES						
PART NO	DESCRIPTION	MAX PSI	FITTING	FITS TUBING OD	WETTED MATERIAL	
ULTRA HIGH PRESSURE						
MXT715-000	2-Position, 6-Port	15,000	10-32	1/16"	UltraLife	
MXT715-102	2-Position, 10-Port	15,000	10-32	1/16"	UltraLife	
HIGH PRESSURE						
MXP7900-000	2-Position, 6-Port	6,000	10-32	1/16"	DuraLife® ¹	
MXP7960-000	2-Position, 10-Port	6,000	10-32	1/16"	DuraLife	
MXP7980-000	2-Position, 6-Port, Nano	5,000	M4	1/32"	DuraLife II ²	
MXP7986-000	2-Position, 10-Port, Nano	5,000	M4	1/32"	DuraLife II	
MXP9900-000	2-Position, 6-Port, Biocompatible	5,000	10-32	1/16"	PEEK	
MXP9960-000	2-Position, 10-Port, Biocompatible	5,000	10-32	1/16"	PEEK	
LOW PRESSURE						
MXX777-601	2-Position, 6-Port	125	—	1/8" or 1/16"	RPC-7 ³	
MXX777-603	2-Position, Double Three Way	125	—	1/8" or 1/16"	RPC-7	
MXX777-612	2-Position, 6-Port, Large Bore	125	—	1/8" or 1/16"	RPC-7	

All of these MXX valves include a set of 1/16" and 1/8" ferrules.

1) DuraLife is a proprietary material combination of SST and an advanced polymer.

2) DuraLife II is a proprietary material combination consisting of Titanium and an advanced polymer.

3) RPC-7 Proprietary Polymer Combination.

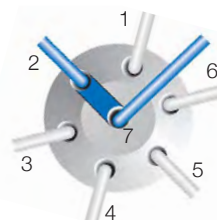


MX units are stackable

IDEX Selection Valves

Selection valves enable discrete connections among multiple system liquids (mobile phase, reagents, buffers) by means of a common port (inlet or outlet) connected to a number of different reciprocal ports. In Diagnostic or Sequencing applications, the selection valve alternates between different reagents or sample streams. Selection valves also enable fractionation for multiple sample analyses.

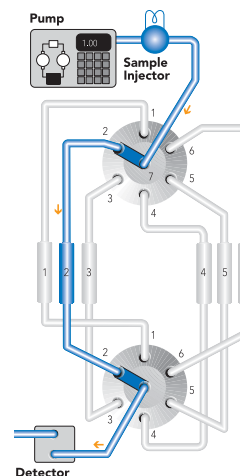
Numerous configurations exist among selection valves (e.g., 6-position 7-port, or 10-position 11-port), but these valves always operate between more than two positions. The ports are usually spaced radially, or outward in some manner around the center port of the stator.



Flow path of Six-Position, Seven-Port Selector Valve

Column Selection

Use Two 6-Position 7-Port Selection Valves to enable multiple column selection



Selection Valves | Manual

IDEX MANUAL SELECTION VALVES						
PART NO	DESCRIPTION	MAX PSI	FITTING	FITS TUBING OD	WETTED MATERIAL	CONFIGURATION
HIGH PRESSURE						
7060	6-Position, 7-Port	6,000	10-32	1/16"	SST & Vespel®	6-Way
MEDIUM PRESSURE						
V-240 ¹	6-Position, 7-Port	1,000	1/4-28	1/16"	Polyimide, PTFE	Multi-port Selection
V-241 ¹	6-Position, 7-Port, Bulkhead Version	1,000	1/4-28	1/16"	Polyimide, PTFE	Multi-port Selection
V-340 ²	6-Position, 7-Port	1,000	1/4-28	1/8"	Polyimide, PTFE	Multi-port Selection
V-341 ²	6-Position, 7-Port, Bulkhead Version	1,000	1/4-28	1/8"	Polyimide, PTFE	Multi-port Selection

1) Includes (6) XP-235

2) Includes (6) XP-335



7060 Manual Selection Valve

TECH TIP

Bulkhead Injection Valves utilize the mounting bracket M-615-2, found on pg 278.

Selection Valves | Actuated

IDEX ACTUATED SELECTION VALVES					
PART NO	DESCRIPTION	MAX PSI	FITTING	FITS TUBING OD	WETTED MATERIAL
ULTRA HIGH PRESSURE					
MXX715-105	6-Position, 7-Port	15,000	10-32	1/16"	UltraLife
HIGH PRESSURE					
MXP7970-000	6-Position, 7-Port	6,000	10-32	1/16"	DuraLife II ¹
LOW PRESSURE					
MXX777-605	6-Position, 7-Port	125	—	1/8" or 1/16"	RPC-7 ²
MXX777-616	6-Position, 7-Port, Large Bore	125	—	1/8" or 1/16"	RPC-7
MXX778-605	10-Position, 11-Port	125	—	1/8" or 1/16"	RPC-7

All of these MXX valves include a set of 1/16" and 1/8" ferrules.

1) DuraLife II is a proprietary material combination consisting of Titanium and an advanced polymer.

2) RPC-7 Proprietary Polymer Combination.



MX units are stackable

Shut-Off Valves

Stop a flow stream quickly with Upchurch Scientific® biocompatible Shut-Off Valves. The blue colorant used in some valve configurations has proven not to leach out with common HPLC solvents.

SHUT-OFF VALVES					
PART NO	TUBING OD	THRU-HOLE	INTERNAL VOL. ¹	MATERIAL	INCLUDES
P-721 ²	1/8"	0.040" (1.0 mm)	10.0 µL	PCTFE, ETFE, Natural	(2) P-335, (2) P-300N
P-732 ²	1/16"	0.020" (0.5 mm)	2.5 µL	PCTFE, PEEK, Natural	(2) XP-235
P-733 ²	1/8"	0.040" (1.0 mm)	10.0 µL	PCTFE, PEEK, Natural	(2) XP-335
P-782	1/16"	0.020" (0.5 mm)	2.5 µL	PCTFE, ETFE, Blue	(2) XP-235
P-783	1/8"	0.040" (1.0 mm)	10.0 µL	PCTFE, ETFE, Blue	(2) XP-335

1) Maximum internal volume, with valve fully open.

2) To order valve without fittings, add an "A" to the end of the part number.



P-721



P-733

Micro-Splitter Valves

The Upchurch Scientific line of Micro-Splitter Valves is designed to accurately split and control a low-flow stream off a single incoming supply. The Graduated Valve offers many of the benefits and features of Micro-Splitter Valves, plus the ability to adjust and set the split flow to repeatable settings. This allows documentation of settings and the resulting flow rates for easier method development. The graduations also make it easier to employ the valve in a system used to run multiple analyses that require different split flow rates.

MICRO-SPLITTER VALVES					
PART NO	DESCRIPTION	THREADS	INTERNAL VOL.* (open/closed)	MAX PRESSURE	INCLUDES
P-450	Standard, Biocompatible	1/4-28	2.14 / 4.1 µL	800 PSI (55 bar)	(3) XP-235
P-451	Standard, Biocompatible	10-32	1.2 / 2.8 µL	800 PSI (55 bar)	(3) F-120
P-460S	High Pressure, SS Needle	10-32	1.2 / 2.8 µL	4,000 PSI (276 bar)	(3) F-120
P-460T	High Pressure, Titanium Needle	10-32	1.2 / 2.8 µL	4,000 PSI (276 bar)	(3) F-120
P-470	HP Graduated, SS Needle	10-32	1.2 / 2.8 µL	4,000 PSI (276 bar)	(3) F-120

*The supply and waste port thru-holes have IDs of 0.020" (0.50 mm). The ID for the split-stream port thru-hole is 0.020" (0.50 mm) in standard versions; in capillary versions it is 0.010" (0.25 mm).



P-450

TECH TIP

All Micro-Splitter Valves have been tested at flow rates to 100 mL/min, with a maximum resulting pressure drop of only 45 PSI (3.1 bar) when the valve is fully opened.

Micro-Metering Valves

For fine control of fluid flow rates, Micro-Metering Valves can reduce outgoing flow to as low as 3.5 µL/min*. These needle valves are perfect for use with peristaltic pump fluid-transfer applications, mass spectrometry, and fraction collection.

Upchurch Scientific Micro Metering Valves can also be used to regulate gas flow in helium sparging lines and as a flow-dependent variable back pressure regulator.

MICRO-METERING VALVES					
PART NO	TUBING OD	THRU-HOLE	INTERNAL VOL. ¹	MATERIAL	INCLUDES
P-445 ²	1/16"	0.020" (0.50 mm)	7.7 µL	PEEK, Back	(2) XP-230
P-446 ²	1/16"	0.020" (0.50 mm)	7.2 µL	PEEK, Back	(2) F-120
P-447	1/8"	0.020" (0.50 mm)	7.7 µL	PEEK, Back	(2) XP-330

1) Maximum internal volume, with valve fully open.

2) To order valve without fittings, add "NF" to the end of the part number.



P-445

RheBuild® Kits, Rapid Replacement Pods & MXX Replacement Fittings

RheBuild® Kits

RheBuild Kits are available for all Rheodyne brand products. Included in each individual RheBuild Kit: rotor seal; stator face assembly; isolation seal; needle guide; needle port cleaner; tools and instructions to maintain precision performance of your valve. RheBuild Kits eliminate individual part ordering.



Rapid Replacement Pods

Replacement pods are easily exchanged as part of scheduled preventive maintenance, or in an emergency, a pod can be substituted quickly while the original is examined and cleaned at your convenience.



RAPID REPLACEMENT PODS

PART NO	FOR VALVE PART NO
PD715-000	MXT715-000
PD715-102	MXT715-102
PD715-105	MXT715-105
PD7900	MXP7900-000
PD7960	MXP7960-000
PD7986	MXP7986-000
PD9900	MXP9900-000
PD9960	MXP9960-000
PD7920	MXP7920-000
PD7970	MXP7970-000
PD7980	MXP7980-000

MXX Replacement Fittings

Use these replacement Ferrules and O-rings for 1/8" and 1/16" tubing with the MXX Series II valves.

MXX REPLACEMENT FITTINGS

PART NO	DESCRIPTION	QTY
7770-039	Ferrules for 1/8" OD Tubing	25/pk
7770-040	Ferrules for 1/8" Tubing	50/pk
7770-041	Ferrules for 1/8" Tubing	100/pk
7770-044	Ferrules for 1/16" OD Tubing	25/pk
7770-046	Ferrules for 1/16" Tubing	100/pk
7770-124	O-Rings for 1/16" OD Tubing	25/pk

RHEBUILD KITS

PART NO	DESCRIPTION
RHEBUILD KITS FOR MX SERIES II™ VALVES	
7150-999	RheBuild Kit for MXT715-000 (includes 2 rotor seals)
7152-999	RheBuild Kit for MXT715-102 (includes 2 rotor seals)
7155-999	RheBuild Kit for MXT715-105 (includes 2 rotor seals)
7920-999	RheBuild Kit for MXP7920-000 and MXP7900-000
7960-999	RheBuild Kit for MXP9960-000 (includes rotor seal and stator face seal)
7961-999	RheBuild Kit for MXP7960-000
7970-999	RheBuild Kit for MXP7970-000
79801-999	RheBuild Kit for MXP7980-000
79861-999	RheBuild Kit for MXP7986-000
7900-999	RheBuild Kit for MXP9900-000 (includes rotor seal and stator face seal)

RHEBUILD KITS FOR MANUAL VALVES

3725-999	RheBuild Kit for models 3725, 3725i, 3725-038, 3735i-038
7010-996	Conversion Kit including Stator Face Assembly for model 7010
7010-997	RheBuild Kit including Stator for model 7010
7010-999	RheBuild Kit for model 7010 and 7010-type Valves
7125-999	RheBuild Kit for models 7125 and 7126
7410-999	RheBuild Kit for model 7410
7520-999	RheBuild Kit for models 7520 and 7526 (includes inlet stator and seal)
7725-999	RheBuild Kit for models 7725 and 7725i
7788-999	RheBuild Kit for model 7725i-188
8125-999	RheBuild Kit for models 8125 and 8126
9010-999	RheBuild Kit for model 9010
9125-999	RheBuild Kit for models 9125 and 9126
9725-999	RheBuild Kit for models 9725 and 9725i; 7725(i) pH upgrade kit

RHEBUILD KITS FOR MX SERIES I™ VALVES

7900-999	RheBuild Kit for models MX7900-000, MX7925-000, MX9900-000, MX9925-000
7960-999	RheBuild Kit for model MX7960-000
7980-999	RheBuild Kit for model MX7980-000
7986-999	RheBuild Kit for model MX7986-000

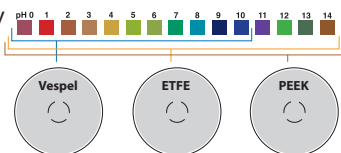
RHEBUILD KITS FOR LABPRO™ & EV AUTOMATED FLUIDIC INSTRUMENTS

1006-999	RheBuild Kit for model PR/EV100-106
5001-999	RheBuild Kit for models PR/EV500-101 and PR/EV550-101
5100-999	RheBuild Kit for models PR/EV500-100 and PR/EV550-100
5104-999	RheBuild Kit for models PR/EV500-104 and PR/EV550-104
7004-999	RheBuild Kit for models PR/EV700-104 and PR/EV750-104
7112-999	RheBuild Kit for models PR/EV700-112 and PR/EV750-112
7501-999	RheBuild Kit for models PR/EV700-100 and PR/EV750-100
7502-999	RheBuild Kit for models PR/EV700-102 and PR/EV750-102
7507-999	RheBuild Kit for models PR/EV700-107 and PR/EV750-107
7531-999	RheBuild Kit for models PR703-100 and PR753-100

Rotor Seals & Stators

Rotor Seals

The standard rotor seal in many Rheodyne® manual valves is made from a Vespel® blend. This polyimide has low wear and high chemical resistance. Vespel tolerates a pH range of 0 to 10. Solutions more basic than pH 10 dissolve Vespel which damages the rotor seal. PEEK offers a high chemical resistance and versatility, and will tolerate the entire pH range from 0 to 14. ETFE blend rotor seals are appropriate for use in applications where PEEK is not generally acceptable, such as when methylene chloride or DMSO in higher concentrations is being used.



Please Note: Rotor seals for MX Series I & Series II Modules are available in the RheBuild Kits section.

ROTOR SEALS		
PART NO	FOR VALVE MODEL NO	DESCRIPTION
ETFE BLEND ROTOR SEALS		
7000-017	7000L, 7040L	ETFE Rotor Seal
7010-071	7010, 7010-087, 7000, 7040	ETFE Rotor Seal
7030-015	7030, 9030	ETFE Rotor Seal
7060-074	7060, 7066, 9060	ETFE Rotor Seal
7125-079	7125, 7125-081, 7725	ETFE Rotor Seal
7410-075	7410	ETFE Rotor Seal
8125-097	8125	ETFE Rotor Seal
9010-051	9010	ETFE Rotor Seal
9125-082	9125, 9725	ETFE Rotor Seal
PEEK BLEND ROTOR SEALS		
3725-018	3725, 3725-038	PEEK Rotor Seal
9010-065	7000, 7010, 9010	PEEK Rotor Seal
8125-119	8125	PEEK Rotor Seal
9125-095	7125, 7725, 9125, 9725	PEEK Rotor Seal
VESPEL BLEND ROTOR SEALS		
7000-016	7000L, 7040L	Vespel Rotor Seal
7010-039	7010, 7000, 7040	Vespel Rotor Seal
7030-003	7030, 9030	Vespel Rotor Seal
7030-014	7030L	Vespel Rotor Seal
7060-070	7060, 7066	Vespel Rotor Seal
7060-064	7060L	Vespel Rotor Seal
7125-047	7125, 7725, 9725	Vespel Rotor Seal
7410-038	7410	Vespel Rotor Seal
7413-013	7413	Vespel Rotor Seal
8125-038	8125	Vespel Rotor Seal

Stators



STATORS	
PART NO	FOR VALVE MODEL NO
STATORS FOR MX SERIES II MODULES	
7123-548	MXT715-000
7123-550	MXT715-105
7123-568	MXT715-102
7770-229	MXP7920-000
7980-004	MXP7980-000
7986-004	MXP7986-000
7900-146	MXP9900-000
7900-179	MXP7900-000
7900-183	MXP7970-000
7960-014	MXP7960-000
9960-002	MXP9960-000
STATORS FOR OTHER RHEODYNE VALVES	
3725-006	3725, 3710-038, 3000-038, 3030-038
7010-069	7000L, 7030L, 7040L
7010-040	7010, 7125, 7000, 7030, 7040
7010-066	7125-081, 7010-087
7060-039	7060, 7066
7060-065	7060L, EV501-100
7123-047	PR/EV500-100
7123-128	PR/EV700-107
7123-142	PR/EV500-104, EV501-104
7123-180	PR703-100, EV700-105
7123-223	PR/EV700-112
7410-041	7410, 7413
7520-035	7520 (outlet)
7650-002	PR/EV700-102
7725-010	7725(i)
7750-070	7750
7750-038	PR/EV700-100
8125-098	8125
9125-043	9125, 9010, 9030, 9725(i)
9650-009	PR/EV750-102
9750-021	PR/EV750-100

Valve Accessories

Valve Wrenches

The smartly designed IDEX Wrench is a double-ended slotted socket wrench that fits over 1/16" and 1/8" OD tubing. It easily loosens and tightens 1/4" and 5/16" hex head stainless steel or PEEK fittings. The "2" shape of the IDEX Wrench provides ideal leverage for changing sample loops and fittings, and keeps one end from restricting the use of the other.



VALVE WRENCHES

PART NO	DESCRIPTION
6810	IDEX Wrench

Mounting Brackets

Rheodyne® mounting brackets and panels of different shapes and sizes organize and provide a sturdy support for Rheodyne valves. The Ring Stand Mounting Bracket now allows the valves to mount onto lab equipment.



MOUNTING BRACKETS

PART NO	DESCRIPTION
---------	-------------

MOUNTING BRACKET ACCESSORIES

7160	Mounting Panel
7160-010	Valve Angle Bracket
7160-029	Ring Stand Mounting Bracket

VALVE MOUNTING BRACKET

M-615-1	For Upchurch Scientific Switching Valves
M-615-2	For Upchurch Scientific Injection and Selection Valves

Injection Port Adapters

To introduce sample, connect 360 µm OD capillary tubing to an Upchurch Scientific® Injection Port Adapter Assembly. This adapter accepts standard 22-gauge Hamilton-style injection syringe needles. No additional swept volume is added to the fluid pathway, as the needle is positioned directly against the connecting tubing during injections. This adapter can be bulkhead mounted or mounted with the V-447 Kits. To introduce a sample directly into a 10-32 port, purchase a M-432-03 separately.



Tubing
(not included)



A: P-416BLK
B: F-152
C: M-432-03

M-432

Micro Injection Port Adapter Assembly

This simple, biocompatible adapter is designed specifically for the Upchurch Scientific Injection Valves and can also convert any 1/4-28 flat-bottom port into a port that can accept a standard 22 gauge HPLC injection needle. This injection port adapter is adjustable, so you can create a snug fit around the needle to prevent any leaking of the analyte. In addition, this product features an internal stop that prevents you from inserting the needle too far, eliminating the possibility of damaging the valve with the needle tip.



P-296

Replaceable Tubing and Ferrule Assembly
(included)

Adapter
Body

Needle Port

P-295

1/4-28 Flat-Bottom Injection Port Adapter

INJECTION PORT ADAPTERS & ACCESSORIES

PART NO	DESCRIPTION
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MICRO INJECTION PORT ADAPTER FOR 360 µm OD TUBING

M-432	Micro Injection Port Adapter Assembly
V-447	Micro Injection Port Adapter Assembly Actuator Mounting Kit Includes (1) M-432 with mini-actuator bracket, (2) mounting screws
F-152	Replacement MicroFerrule for M-432, Natural PEEK
M-432-03	Replacement Tubing/Fitting Assembly for M-432 & M-433
P-416BLK	Replacement Ferrule Nut for M-432, Black PEEK

1/4-28 FLAT-BOTTOM INJECTION PORT ADAPTER

P-295	Adjustable Injection Port Adapter, accepts a 22 gauge needle
P-296	Replacement Tubing/Ferrule Assembly

Valve Accessories

Needle Port Accessories



The Rheodyne® adaptable Loop Filler Ports (Part #7012 and 9012) are used to load sample from syringe needles or luer tips. The Needle Port (Part #9013) conserves sample by minimizing the volume between the needle and the valve.



NEEDLE PORT ACCESSORIES

PART NO	DESCRIPTION
7012	Stainless Steel Loop Filler Port
7125-054	Needle Port Cleaner
9012	PEEK Loop Filler Port
9013	Peek Needle Port
9125-076	Suction Needle Adapter (for Model 9725)

Hamilton Syringes for Manual HPLC Valves

- ➔ Point style 3, 22 or 22s gauge needle
- ➔ For IDEX analytical valves (Rheodyne & Upchurch)



HAMILTON 700 SERIES SYRINGES									
		VOLUME	10 µL	25 µL	50 µL	100 µL	250 µL	500 µL	
		MODEL	701	702	705	710	725	750	
		GAUGE	22s	22s	22s	22s	22	22	
		Cemented Needle (N) Syringe	80365	80465	80565	80665	80765	80865	
<p>*s" indicates thicker wall for added strength</p>									
HAMILTON 1700 SERIES SYRINGES									
		VOLUME	10 µL	25 µL	50 µL	100 µL	250 µL	500 µL	
		MODEL	1701	1702	1705	1710	1725	1750	
		GAUGE	22s	22s	22s	22s	22s	22	
		Cemented Needle (N) Syringe	N/A	80275	80975	81075	81175 ²	81216 ²	
		Removable Needle (RN) Syringe	80065	80265	80965	81065	81165 ¹	81265	
		Removable Needle (RN) Syringe (needle sold separately)	7653-01	7654-01	7655-01	7656-01	7657-01	7658-01	
		Replacement Needles (sold separately)	Point Style	Small RN	Small RN	Small RN	Small RN	Large RN	Large RN
			3	7770-01	7770-01	7770-01	7770-01	7780-03	7780-04
		Luer Tip (LT) Syringe (needle sold separately)	80001	80201	80901	81001	81101	81201	
		PTFE Luer Lock (TLL) Syringe (needle sold separately)	N/A	N/A	80920	81020	81120	81220	
		Replacement Needles (sold separately)	Point Style	Metal Hub	Metal Hub	Metal Hub	Metal Hub	Metal Hub	Metal Hub
			3	91038	91038	91038	91038	91038	91022
				Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub
			3	90534	90534	90534	90534	90534	90134

For Syringe Calibration Service, add the prefix "CAL" to the beginning of the syringe's part number.

Note: Needles are 51 mm

1) 22 gauge

2) LTN Termination



See Hamilton Manual Syringes (pg 408)

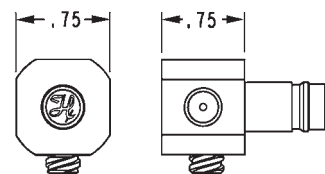
Hamilton (HV) Plug Valves

- ➔ Wetted paths are chemically inert PTFE and Kel-F® materials (100 PSI or less)
- ➔ Valves are for stand alone use or HVX and HVP valves can be panel mounted
- ➔ Valve position is controlled manually via a handle attached to the valve stem
- ➔ Valve connections are via 1/4-28 UNF-2B (Unified Fine) fittings; see specific valve information - thread depths vary

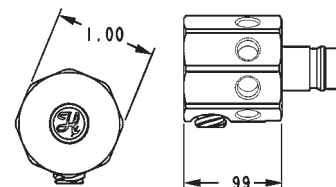
The HV valve is physically the smallest valve and constitutes a basic unit for the control of fluids. It is ideal for low pressure applications; from a basic on/off flow to a four-way distribution system.

The HVP valve is essentially the same as the HV valve except the HVP can be mounted into panels allowing for custom installation into control panels or instruments.

HVX valves are physically the largest valves. A larger port internal diameter allows increased fluid flows even with moderately viscous fluids. HVX valves can be used free standing or panel-mounted using an optional locking nut, Part # 35121. 6- and 8-port distribution and loop valves are available only in the HVX body style.



HV Configuration



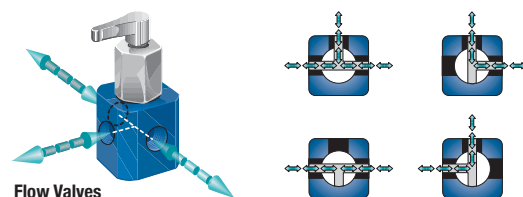
HVX Configuration

HAMILTON MINIATURE INERT VALVES			
	HV	HVP	HVX
Description	Small Body	Panel Mount, Small Body	Large Body
Valve Outer Body Dimension	3/4"	3/4"	1"
Port Orifice	.059"	.059"	.118"
Panel Mounting	No	Yes	Yes
Panel Thickness	N/A	.150" (3.8 mm)	.625" (15.9 mm)

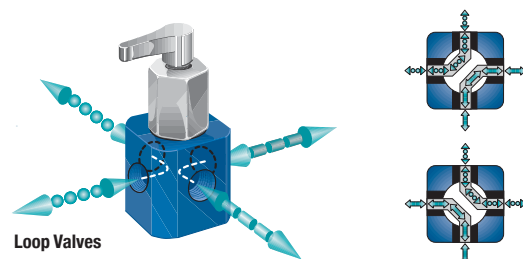
*The port orifice for 6- and 8-way distribution HVX valves is .059".
 The port orifice for 6- and 8-way loop HVX valves is .040".
 HVX valves require optional locking nut, part #35121, for panel mount applications.



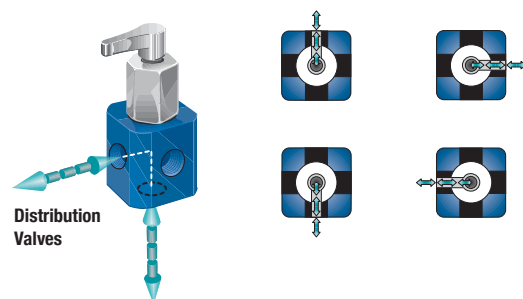
Flow Valves are used to direct or redirect fluids. 2-, 3-, and 4 -port valves are available with straight through (180°), 90°, or "T" type plugs for seven different valves. All seven flow configurations are available as HV, HVP and HVX valves. The flow configuration drawings show the possible fluid flow paths for a three port flow valve with a "T" type plug.



Loop valves are used to direct and redirect fluids. 4-, 6-, or 8- port valves are available with a loop type valve plug. The 4- port valve is available in HV, HVP and HVX body styles. The 6- and 8-port valves are only available in the HVX body style. The flow configuration drawings show the possible fluid flow paths for a 4-port valve with a loop type plug.



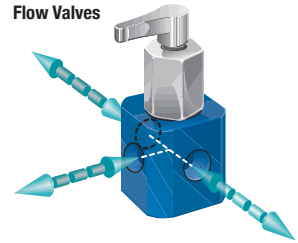
Distribution valves are used to direct fluid to a number of locations. 2-, 3-, 4-, 6- and 8-port valves are available with a distribution type valve plug. The 2-, 3-, and 4-port distribution valves are available in HV, HVP and HVX body styles. The 6- and 8-port valves are available only in the HVX body style. The flow configuration drawings show the possible fluid flow paths for a 4-port valve with a distribution type plug.



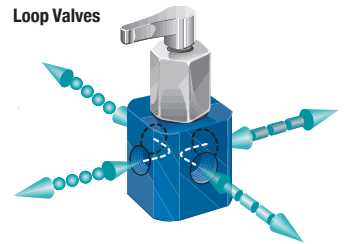
HAMILTON (HV) PLUG VALVES						
FLOW DIAGRAM	VALVE DESCRIPTION	VALVE MODEL	HV	HVP	HVX	
	180° Flow Path 2-ports	1-1	86725	86775	86901*	
	90° Flow Path 2-ports	2-2	86726	86776	86902*	
	"T" Flow Path 3-ports	3-3	86727	86777	86903*	
	90° Flow Path 3-ports	3-2	86728	86778	86904*	
	Loop Flow Path 4-ports	4-4	86729	86779	86905*	
	"T" Flow Path 4-ports	4-3	86730	86780	—	
	90° Flow Path 4-ports	4-2	86731	86781	86907*	
	180° Flow Path 4-ports	4-1	86732	—	—	
	Distribution Flow Path 2-ports	1-5	86735	86785	86910*	
	Distribution Flow Path 2-ports	2-5	86736	86786	86911*	
	Distribution Flow Path 3-ports	3-5	86737	86787	86912*	
	Distribution Flow Path 4-ports	4-5	86738	86788	86913*	
	Distribution Flow Path 6-ports	6-5	—	—	86915	
	Loop Flow Path 6-ports	6-6	—	—	86915**	
	Distribution Flow Path 8-ports	8-5	—	—	86918	
	Loop Flow Path 8-ports	8-7	—	—	86919**	

Note: All valves have .059"/1.5 mm diameter ports unless otherwise specified.
 * Valve has .118"/3 mm diameter ports. **Valve has .040"/1 mm diameter ports.
 Thread depth: All valves have 1/4" x 28 UNF 2B ↓ .250 threads unless otherwise specified.

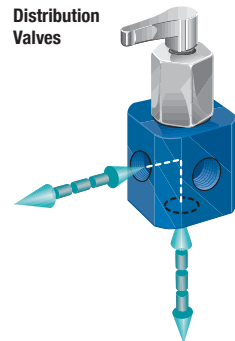
Flow Valves



Loop Valves



Distribution Valves



- Green circle denotes there is a fixed fluid path in the face of the valve fluid always flows through
- ➔ Blue arrow is a path that rotates and can flow to any port, as indicated by the black directional arrows

ACCESSORIES FOR HV PLUG VALVES

PART NO	DESCRIPTION
35121	Optional locking nut to panel mount HVX
P-208	Short Flangeless 1/4-28 nut for 1/16" OD, 10/pk
P-240	Small valve ferrule for 1/16" OD, 10/pk
P-340	Small valve ferrule for 1/8" OD, 10/pk

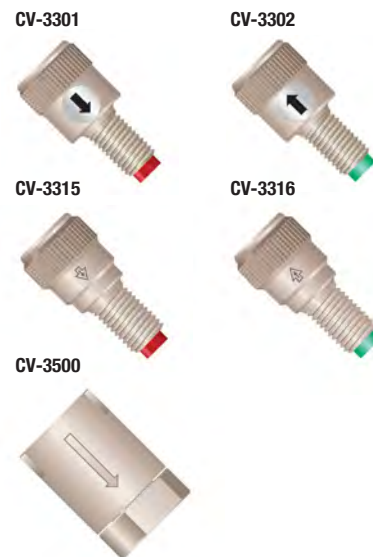
Standard 1/4-28 & Nonmetallic 10-32 Micro-Volume Inline Check Valves

The 1/4-28 Upchurch Scientific Inline Check Valve's spring-actuated sealing pattern eliminates back flow, helping to prevent upstream contamination or damage. In addition, the unique design of this product eliminates the additional tubing cuts and connections required to install conventional inline check valves.

With a swept volume of only 7.4 µL, the Upchurch Scientific Inline Micro-Volume Check Valve is perfect for applications where low flow path volume is critical, such as delivery to lab-on-a-chip, single-cell analysis and micro- or nano-LC post-column derivatization. Once installed, this check valve helps prevent back flow and the potential for contamination or damage to sensitive upstream equipment.

TECH TIP

- ➔ **Cracking Pressure:** the pressure required for the valve to open in the direction of the arrow
- ➔ **Maximum Pressure:** the maximum pressure the valve can experience in the reverse direction without leaking backwards
- ➔ **Back Pressure Created:** the amount of back pressure generated by the check valve with 50 mL/min room temperature water flowing in the direction of the arrow



STANDARD 1/4-28 & NONMETALLIC 10-32 MICRO-VOLUME INLINE CHECK VALVES							
PART NO	DESCRIPTION	THREADS	SWEPT VOL	THRU-HOLE	MAX PRESSURE	BACK PRESSURE	CRACKING PRESSURE
STANDARD 1/4-28 INLINE CHECK VALVES							
CV-3301	Inlet	1/4-28 FB, M to 1/4-28 FB, F	20 µL	0.020" (0.50 mm)	2,000 PSI (138 bar)	45 PSI (3.1 bar)	15 PSI (1 bar)
CV-3302	Outlet	1/4-28 FB, M to 1/4-28 FB, F	20 µL	0.020" (0.50 mm)	2,000 PSI (138 bar)	45 PSI (3.1 bar)	15 PSI (1 bar)
CV-3315	Inlet	1/4-28 FB, M to 1/4-28 FB, F	16 µL	0.020" (0.50 mm)	2,000 PSI (138 bar)	10 PSI (0.7 bar)	3 PSI (0.2 bar)
CV-3316	Outlet	1/4-28 FB, M to 1/4-28 FB, F	16 µL	0.020" (0.50 mm)	2,000 PSI (138 bar)	10 PSI (0.7 bar)	3 PSI (0.2 bar)
NONMETALLIC 10-32 MICRO-VOLUME INLINE CHECK VALVE							
CV-3500	Inlet/Outlet	10-32 C, F to 10-32 C, F	7.4 µL	0.010" (0.25 mm)	3,000 PSI (207 bar)	25 PSI (1.7 bar)	8 PSI (0.6 bar)

Nonmetallic 1/4-28 & 10-32 Inline Check Valves

Upchurch Scientific Nonmetallic Inline Check Valves provide excellent backflow protection for sensitive equipment along with outstanding chemical resistance guaranteed by the PEEK polymer and perfluoroelastomer construction. Metal-free composition makes these check valves perfect for use with corrosive fluids or biological samples. These check valves function well up to moderately-high pressure applications. Low internal volume allow them to be used in areas where flow path volume is important; however, higher flow rates can pass through with minimal pressure drop.



NONMETALLIC 1/4-28 & 10-32 INLINE CHECK VALVES							
PART NO	DESCRIPTION	THREADS	SWEPT VOL	THRU-HOLE	MAX PRESSURE	BACK PRESSURE	CRACKING PRESSURE
CV-3320	Inlet	1/4-28 FB, M to 1/4-28 FB, F	37 µL	0.020" (0.50 mm)	2,000 PSI (138 bar)	30 PSI (2.1 bar)	1 PSI (0.07 bar)
CV-3321	Outlet	1/4-28 FB, M to 1/4-28 FB, F	37 µL	0.020" (0.50 mm)	2,000 PSI (138 bar)	30 PSI (2.1 bar)	1 PSI (0.07 bar)
CV-3322	Inlet	1/4-28 FB, M to 1/4-28 FB, F	49 µL	0.040" (1.0 mm)	2,000 PSI (138 bar)	30 PSI (2.1 bar)	1 PSI (0.07 bar)
CV-3323	Outlet	1/4-28 FB, M to 1/4-28 FB, F	49 µL	0.040" (1.0 mm)	2,000 PSI (138 bar)	30 PSI (2.1 bar)	1 PSI (0.07 bar)
CV-3324	Inlet	1/4-28 FB, M to 1/4-28 FB, F	182 µL	0.060" (1.60 mm)	2,000 PSI (138 bar)	30 PSI (2.1 bar)	1 PSI (0.07 bar)
CV-3325	Outlet	1/4-28 FB, M to 1/4-28 FB, F	182 µL	0.060" (1.60 mm)	2,000 PSI (138 bar)	30 PSI (2.1 bar)	1 PSI (0.07 bar)
CV-3330	Inlet/Outlet	1/4-28 FB, F to 1/4-28 FB, F	34 µL	0.020" (0.50 mm)	2,000 PSI (138 bar)	30 PSI (2.1 bar)	1 PSI (0.07 bar)
CV-3335	Inlet	1/4-28 FB, F to 10-32 C, M	49 µL	0.020" (0.50 mm)	2,000 PSI (138 bar)	30 PSI (2.1 bar)	1 PSI (0.07 bar)
CV-3336	Outlet	1/4-28 FB, F to 10-32 C, M	49 µL	0.020" (0.50 mm)	2,000 PSI (138 bar)	30 PSI (2.1 bar)	1 PSI (0.07 bar)
CV-3340	Inlet/Outlet	10-32 C, F to 10-32 C, F	34 µL	0.020" (0.50 mm)	2,000 PSI (138 bar)	30 PSI (2.1 bar)	1 PSI (0.07 bar)

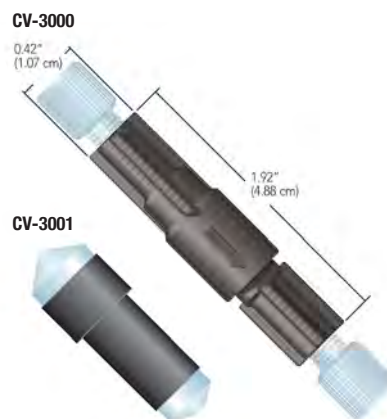
Quick-Stop Luer & Inline Cartridge Check Valves

The Quick-Stop Luer Check Valve is designed to provide inline luer connect/disconnect convenience without the mess and hazard of spills. Just connect the valve assembly to your inline tubing using standard 1/4-28 flat-bottom fittings. The check valve is automatically opened once the luer connection is engaged, allowing flow in either direction. Disconnecting the luer union causes the check valve to close.

Upchurch Scientific cartridge style Inline Check Valves are designed to limit flow to one direction. These assemblies withstand system pressures of 1,000 PSI (69 bar). The cracking pressures are 1.5 PSI (0.1 bar) for the CV-3001 and 3 PSI for the CV-3011. Tolerance on the cracking pressure for CV-3001 is ± 0.5 PSI (0.03 bar) and ± 1.5 PSI (0.1 bar) on CV-3011.



QUICK-STOP LUER & INLINE CARTRIDGE CHECK VALVES			
PART NO	DESCRIPTION	SWEPT VOLUME	INCLUDES
QUICK-STOP LUER CHECK VALVES			
P-696	Quick-Stop Luer Check Valve Assembly	127 μ L	(1) P-697, (1) P-655
P-697	Quick-Stop Luer Check Valve	107 μ L	
P-699	Bulkhead Quick-Stop Luer Valve	107 μ L	(1) nut/lock washer set
INLINE CARTRIDGE CHECK VALVES			
CV-3000	Inline Check Valve Assembly for 1/16" OD tubing	96 μ L	(1) CV-3001, (2) XP-215
CV-3001	Inline Check Valve Cartridge for CV-3000	91 μ L	
CV-3010	Inline Check Valve Assembly for 1/8" OD tubing	100 μ L	(1) CV-3011, (2) XP-315
CV-3011	Inline Check Valve Cartridge for CV-3010	92 μ L	



Application Note

- ➔ **Inlet Solvent Reservoir:** Quickly change your solvent on the low pressure end of an HPLC system, while preventing potentially hazardous spills. Just install a Quick-Stop Luer Check Valve Assembly between your solvent reservoir and the pump, with the valve towards the bottle. The valve will prevent solvent leakage from the line coming from the reservoir, while the check valves in your pump prevent spills from the line leading to the pump. With both lines still full of solvent, this system also helps reduce the need to reprime your pump.
- ➔ **FIA Sample Injection:** The Quick-Stop Luer Check Valve provides a practical means to introduce a sample into FIA and other low pressure systems, when used in conjunction with a P-612 Pressure Relief Valve Tee (page 285). Simply connect the Tee into the appropriate flow path line with the included fittings and thread the P-697 Quick-Stop Luer Valve onto the 1/4-28 male end of the Tee. Sample can then be introduced conveniently by using a standard luer-tipped syringe. The check valve is automatically opened when the syringe is attached and closed when the syringe is removed.
- ➔ **Post Column Derivatization:** For post-column derivatization, place a CV-3000 Inline Check Valve on the effluent side of your column to prevent derivatizing agents from flowing backwards and poisoning the column. Placement on the post-column reagent line will also prevent mobile phase from contaminating the reagent if the auxiliary pump fails.
- ➔ **Helium Sparging Tank Protection:** Try the CV-3010 Assembly, designed specifically for degassing (sparging) lines to prevent solvent backup if the sparging gas runs out. This check valve will help prevent potential solvent cross-contamination and damage to the gas regulating valve.

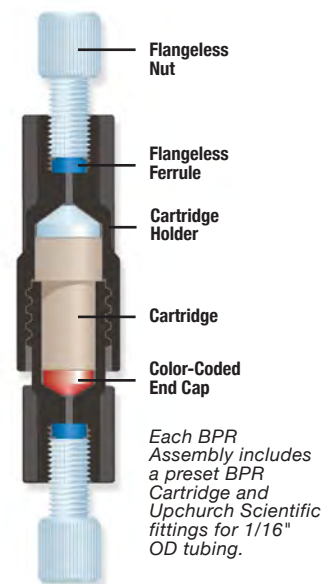
Back Pressure Regulators (BPRs)

Choose from Biocompatible and Stainless Steel BPR Assemblies, each complete with a replaceable, factory preset cartridge (except the 5 and 20 PSI versions).

Upchurch Scientific BPR Assemblies create incremental back pressures ranging from 5 – 1,000 PSI (0.3 – 69 bar). The Biocompatible BPR Assemblies feature a PEEK holder; polymer-based fittings; biocompatible BPR cartridges and wrenches for tightening. Stainless Steel BPR assemblies feature the same biocompatible BPR cartridges with a 316 stainless steel holder and polymer fittings.

The recommended operating flow rate range for our BPR Cartridges is 0.1 – 10 mL/min. Within this range, the amount of back pressure created by the BPR Cartridges and Assemblies will not vary more than $\pm 10\%$. Lower or higher flow rates may result in larger pressure fluctuations. Materials of construction include: PEEK, ETFE, perfluoroelastomer, and gold-plated stainless steel.

Please Note: These Back Pressure Regulator Holders are designed to allow each cartridge to operate at its stated pressure setting when tightened to 20 in-lbs. of torque. To approximate this level of torque, first finger tighten the Holder, then tighten an additional 1/8 – 1/4 turn with the supplied wrenches.



TECH TIP

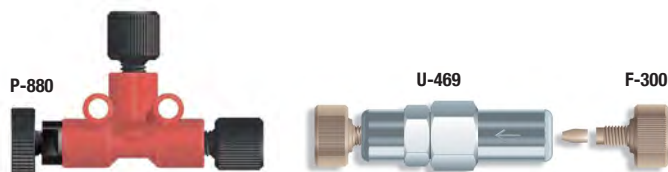
Small gas bubbles often form as solvent moves from the high pressure of an HPLC column to the low pressure environment leading to the detector. This outgassing can cause erratic baseline readings and loss of sensitivity. Placing an Upchurch Scientific BPR (usually a 40 – 100 PSI) after the detector provides an excellent, low-cost method for reducing this problem by maintaining enough back pressure on the mobile phase to keep gases dissolved in solution.

A back pressure regulator can also be used as a pump preload for low and fluctuating pressure applications. Many of today's pumps require a steady back pressure to function properly. Install an Upchurch Scientific BPR (usually 500 – 1,000 PSI) between the pump and the injector to enhance pump performance.

BACK PRESSURE ASSEMBLIES				
PART NO	PRESSURE SETTING	HOLDER MATERIAL	INCLUDES	SWEPT VOLUME
P-790	5 PSI	PEEK	(2) XP-215	134 μ L
P-791	20 PSI	PEEK	(2) XP-215	134 μ L
P-785	40 PSI	PEEK	(1) P-761, (2) XP-215	131 μ L
P-786	75 PSI	PEEK	(1) P-762, (2) XP-215	131 μ L
P-787	100 PSI	PEEK	(1) P-763, (2) XP-215	131 μ L
P-788	250 PSI	PEEK	(1) P-764, (2) XP-235	102 μ L
P-789	500 PSI	PEEK	(1) P-765, (2) P-250, (2) LT-115	96 μ L
P-455	1,000 PSI	PEEK	(1) P-796, (2) P-250, (2) LT-115	89 μ L
U-605	40 PSI	SST	(1) P-761, (2) XP-201	129 μ L
U-606	75 PSI	SST	(1) P-762, (2) XP-201	129 μ L
U-607	100 PSI	SST	(1) P-763, (2) XP-201	129 μ L
U-608	250 PSI	SST	(1) P-764, (2) XP-201	99 μ L
U-609	500 PSI	SST	(1) P-765, (2) XP-201	93 μ L
U-610	750 PSI	SST	(1) P-795, (2) P-250, (2) LT-115	91 μ L
HIGH PRESSURE ADJUSTABLE BPR ASSEMBLY				
P-880	2,000 – 5,000 PSI		(2) F-120BLK	9 μ L

REPLACEMENT CARTRIDGES				
PART NO	PRESSURE SETTING	BODY	ENDCAP	SWEPT VOLUME
P-761	40 PSI	Tan	Blue	125 μ L
P-762	75 PSI	Tan	Yellow	125 μ L
P-763	100 PSI	Tan	Red	125 μ L
P-764	250 PSI	Tan	White	95 μ L
P-765	500 PSI	Tan	Green	89 μ L
P-795	750 PSI	Black	Blue	87 μ L
P-796	1,000 PSI	Black	Green	83 μ L

BPR HOLDERS				
PART NO	HOLDER STYLE	HOLDER MATERIAL	INCLUDES	SWEPT VOLUME
P-465	Biocompatible BPR	PEEK	(2) P-250, (2) LT-115	7 μ L
U-469	High Pressure BPR	SST	(2) F-300	4 μ L



Ultra-Low Volume Back Pressure Regulators (BPR)

Ultra-Low Volume Back Pressure Regulators (BPRs) were developed to minimize swept volume, which is especially important for multi-detector applications. With a maximum swept volume of only 6 µL, it is nearly impossible to detect these BPRs as part of your fluid pathway.

ULTRA-LOW VOLUME BPR SPECIFICATIONS

PART NO	BACK PRESSURE SETTING	FLOW RATE RECOMMENDATIONS	RECOMMENDED PRESSURE RANGE PSI (BAR)	1/16" OD TUBING
M-410	100 ² (7) ²	Optimal: 100 µL – 1 mL/min Max: 4 mL/min	40 – 150 (3 – 10)	PEEK, 0.010" ID
M-412	500 ² (34) ²	Optimal: 100 µL – 1 mL/min Max: 4 mL/min	250 – 525 (17 – 36)	PEEK, 0.010" ID
M-420	100 ² (7) ²	Optimal: 3 – 8 mL/min Max: 10 mL/min	45 – 150 (3 – 10)	PEEK, 0.020" ID

ULTRA-LOW VOLUME BPR ORDERING INFORMATION

PART NO	DESCRIPTION	PRESSURE SETTING	TUBING OD	SWEPT VOLUME	INCLUDES
M-410	Low Flow	100 PSI (7 bar)	1/16"	6 µL	XP-230
M-412	Low Flow	500 PSI (34 bar)	1/16"	6 µL	XP-230
M-420	High Flow	100 PSI (7 bar)	1/16"	6 µL	XP-230

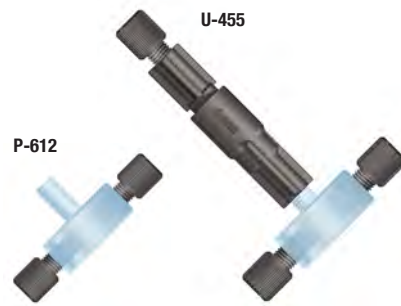


Pressure Relief Valves

Upchurch Scientific Pressure Relief Valves are ideal for preventing system over-pressurization. The 100 PSI version is a good, general purpose valve, while the 5 PSI version is perfect for protecting syringe and peristaltic pump systems.

PRESSURE RELIEF VALVES

PART NO	DESCRIPTION	PRESSURE SETTING	TUBING OD	SWEPT VOLUME	INCLUDES
U-455	Assembly	5 PSI (0.3 bar)	1/16"	148 µL	XP-201
U-456	Assembly	100 PSI (7 bar)	1/16"	139 µL	XP-201, wrenches
P-612	Tee		1/16"	14 µL	XP-201
P-612S	Tee		3/16"	348 µL	XP-201



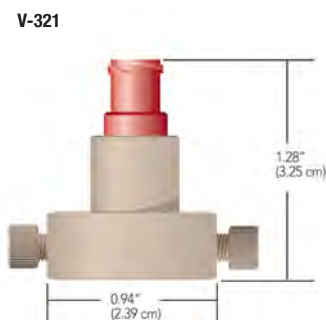
Universal Prime/Purge Valves

The Upchurch Scientific Universal Prime/Purge Valve is easy to operate. Simply install a valve along the flow path with the included fittings and attach a luer-tipped syringe. Then, withdraw the plunger and watch as solvent residual bubbles are removed from the solvent line. The valve automatically closes when the syringe is removed.

The valve is designed to be used with 1/8" OD tubing. Optional mounting is made easy by the handy holes in the body of each unit.

UNIVERSAL PRIME/PURGE VALVES

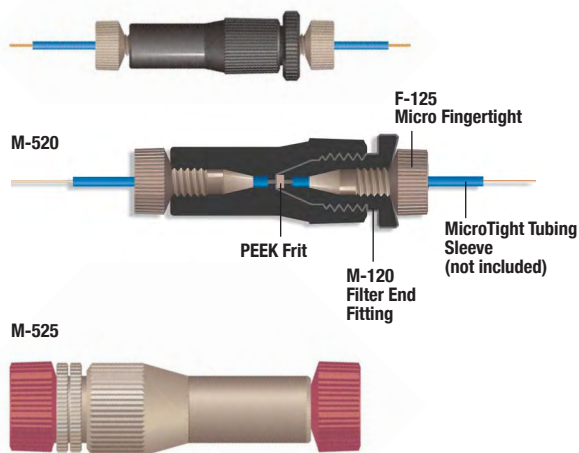
PART NO	DESCRIPTION	INCLUDES
B-310	10 cc Disposable Luer-Tipped Syringe	
V-321	Universal Prime/Purge Valve	(2) P-300N, (2) P-335



Inline Solvent Filters

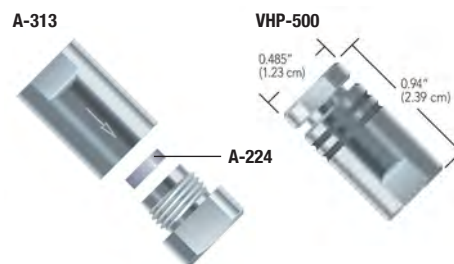
Inline MicroFilters

- ➔ 100% biocompatible PEEK polymer option available
- ➔ Minuscule 240 nL void volume
- ➔ Two versions:
Direct connect 1/32" OD tubing or use MicroTight® tubing sleeves for 70 – 520 µm OD capillary tubing



Standard Inline Solvent Filters

- ➔ For 1/16" OD tubing
- ➔ Versions for Standard HPLC (6,000 PSI/414 bar) and UHPLC (25,000 PSI/1,725 bar)
- ➔ Replacement frits available
- ➔ Help prevent particulate contamination from clogging sensitive equipment
- ➔ Ideally suited for placement along the flow path line between the pump and injection valve/autosampler

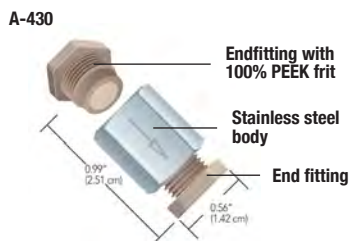


INLINE SOLVENT FILTERS								
PART NO	DESCRIPTION	POROSITY	FOR TUBING	THREADS	SWEPT VOLUME	PRESSURE RATING	INCLUDES	QTY
INLINE MICROFILTERS								
M-520	Inline MicroFilter Assy, PEEK Frit	0.5 µm	MicroTight Tubing Sleeve	MicroTight Tubing Sleeve	240 nL	4,000 PSI (276 bar)	(5) M-120, (2) F-125	ea
M-525	Inline MicroFilter Assy, PEEK Frit	0.5 µm	1/32" OD	1/32" OD	240nL	4000 PSI (276 bar)	(5) M-140, (2) F-126	ea
REPLACEMENT INLINE MICROFILTER END-FITTINGS								
M-120	End-Fittings, Black, with PEEK Frit	0.5 µm	MicroTight Tubing Sleeve	MicroTight Tubing Sleeve	216 nL	N/A	N/A	10/pk
M-140	End-Fittings, Natural, with PEEK Frit	0.5 µm	1/32" OD	1/32" OD	216 nL	N/A	N/A	10/pk
INLINE SOLVENT FILTERS								
A-313	Solvent Filter Assembly	20 µm	1/16" OD	10-32 Coned	12.3 µL	6000 PSI (414 bar)	(1) A-224	ea
A-314	Solvent Filter Assembly	2 µm	1/16" OD	10-32 Coned	4 µL	6000 PSI (414 bar)	(1) A-100	ea
A-100	Replacement Frits, SS	2 µm	N/A	—	1.4 µL	N/A	—	ea
A-224	Replacement Frits, SS	20 µm	N/A	—	9.7 µL	N/A	—	ea
VHP-500	Inline VHP Filter	0.5 µm	1/16" OD	10-32 Coned	1.2 µL	25000 PSI (1725 bar)	(5) VHP-501	ea
VHP-505	Inline VHP Filter	0.2 µm	1/16" OD	10-32 Coned	1.1 µL	25000 PSI (1725 bar)	(5) VHP-506	ea
VHP-501	Repl Inline VHP Frit	0.5 µm	N/A	N/A	0.60 µL	N/A	N/A	ea
VHP-506	Repl Inline VHP Frit	0.2 µm	N/A	N/A	0.54 µL	N/A	N/A	ea

Inline Solvent Filters (cont.)

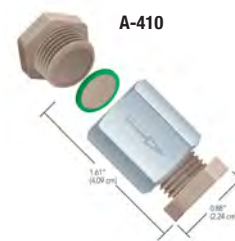
Biocompatible Standard Inline Filters

- ➔ 0.5 µm and 2 µm versions
- ➔ 100% PEEK flow path
- ➔ Recommended flow rate is 25 mL/min for the A-430 filter and 10 mL/min for the A-431 filter.



Biocompatible Semi-Prep Inline Filters

- ➔ Versions for 1/16", 1/8", 3/16", 1/4" and 5/16" OD tubing
- ➔ 100% PEEK flow path
- ➔ Ideal for many higher flow analytical, semi-prep and preparative applications.
- ➔ Frits are interchangeable



INLINE SOLVENT FILTERS

PART NO	DESCRIPTION	POROSITY	THREADS	SWEPT VOLUME	PRESSURE RATING	INCLUDES	QTY
BIOCOMPATIBLE INLINE FILTERS							
A-430	Biocompatible Filter Assy	2 µm	10-32 Coned	7.1 µL	6,000 PSI (414 bar)	(1) A-429	ea
A-431	Biocompatible Filter Assy	0.5 µm	10-32 Coned	5.9 µL	6,000 PSI (414 bar)		ea
A-428x	PEEK Filter End Fittings, Black PEEK body	0.5 µm	10-32 Coned	5.7 µL	N/A		10/pk
A-429x	PEEK Filter End Fittings, Natural PEEK body	2 µm	10-32 Coned	6.9 µL	N/A		10/pk
OC-419BLK	Omega End Fitting, Black Hex	N/A	N/A	N/A	N/A	N/A	ea
SEMI-PREP INLINE FILTERS							
A-330	Semi-Prep Filter Assy	10 µm	10-32 Coned	223 µL	7,500 PSI (517 bar)		ea
A-360	Semi-Prep Filter Assy	10 µm	5/16-24 Flat Btm	235 µL	3,500 PSI (207 bar)		ea
A-331	Stainless Steel Frits, Natural ETFE ring	10 µm	N/A	142 µL	N/A		ea
A-332	Stainless Steel Frits, Natural ETFE ring	2 µm	N/A	122 µL	N/A		ea
A-337	Stainless Steel Frits, Natural ETFE ring	20 µm	N/A	152 µL	N/A		ea
BIOCOMPATIBLE SEMI-PREP INLINE FILTERS							
A-410	Biocompatible Filter Assy	2 µm	10-32 Coned	89 µL	6,000 PSI (414 bar)		ea
A-411	Biocompatible Filter Assy	10 µm	10-32 Coned	103 µL	6,000 PSI (414 bar)		ea
A-510	Biocompatible Filter Assy	5 µm	5/16-24 Flat Btm	89 µL	500 PSI (34 bar)		ea
OC-802	PEEK Frit, Green PCTFE ring	2 µm	N/A	46 µL	N/A		ea
OC-803	PEEK Frit, Natural PCTFE ring	10 µm	N/A	57 µL	N/A		ea
OC-805	PEEK Frit, Natural PCTFE ring	5 µm	N/A	50 µL	N/A		ea

Frit-In-A-Ferrule™

The Upchurch Scientific® Frit-In-A-Ferrule product line is designed to seal and filter simultaneously by incorporating a frit into the body of a flat-bottom ferrule. This simple design allows you to eliminate traditional inline filters and reduce the number of additional connections in your system.



FRIT-IN-A-FERRULE & DISPOSABLE SAMPLE FILTERS

PART NO	DESCRIPTION	POROSITY	FRIT MATERIAL	FRIT DIAMETER	FRIT THICKNESS	SWEPT VOLUME	MAXIMUM PRESSURE	QTY
FRIT-IN-A-FERRULE FOR 1/16" OD TUBING								
P-270	Super Flangeless, natural PEEK, SST lock ring	2 µm	SST	0.062"	0.062"	0.71 µL	2,500 PSI (172 bar)	10/pk
P-272	Flangeless, Green PCTFE	2 µm	SST	0.062"	0.062"	0.71 µL	2,000 PSI (138 bar)	10/pk
P-273	Flangeless, Blue PCTFE	0.5 µm	SST	0.062"	0.062"	0.61 µL	2,000 PSI (138 bar)	10/pk
P-274	Super Flangeless, Natural PEEK, SST lock ring	2 µm	PEEK	0.046"	0.030"	0.20 µL	2,500 PSI (172 bar)	10/pk
P-275	Super Flangeless, Black PEEK, SST lock ring	0.5 µm	PEEK	0.046"	0.030"	0.16 µL	2,500 PSI (172 bar)	10/pk
P-276	Super Flangeless, Red ETFE, SST lock ring	10 µm	SST	0.062"	0.062"	0.90 µL	2,500 PSI (172 bar)	ea
FRIT-IN-A-FERRULE FOR 1/8" OD TUBING								
P-372	Flangeless, Green PCTFE	2 µm	SST	0.094"	0.062"	1.69 µL	500 PSI (34 bar)	10/pk
P-373	Flangeless, Blue PCTFE	0.5 µm	SST	0.094"	0.062"	1.41 µL	500 PSI (34 bar)	10/pk
P-374	Super Flangeless**, Natural PEEK, SST lock ring	2 µm	PEEK	0.094"	0.042"	1.15 µL	2,500 PSI (172 bar)	10/pk

Mini MicroFilters

- Total volume as low as 10 nL
- Conductive version for CEC and mass spectrometry applications
- Three styles available direct connect 1/32" OD or 360 µm OD tubing and a variety of capillary sizes using MicroTight® tubing sleeves (70 – 520 µm)

Filter Capsule Color Identification

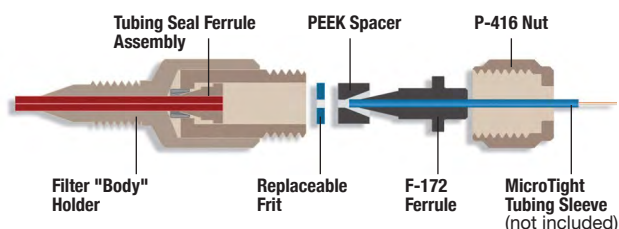


Precolumn MicroFilters

- Direct connects to columns with 10-32 threads
- Total void volume of 0.5 µL



M-500



MICROFILTERS

PART NO	DESCRIPTION	POROSITY	FRICT TYPE	FOR USE WITH	SWEPT VOLUME	PRESSURE RATING	INCLUDES
MINI MICROFILTER ASSEMBLY							
M-543	Mini MicroFilter Assy	1 µm	SST Screen	1/32" (790 µm) OD	97 nL	4,000 PSI (276 bar)	(5) M-131, (2) F-112, (2) P-416
M-547	Mini MicroFilter Assy	1 µm	SST Frit	1/32" (790 µm) OD	22 nL	4,000 PSI (276 bar)	(5) M-133, (2) F-112, (2) P-416
M-548	Mini MicroFilter Assy	1 µm	Ti Frit	1/32" (790 µm) OD	22 nL	4,000 PSI (276 bar)	(5) M-134, (2) F-112, (2) P-416

REPLACEMENT MINI MICROFILTER CAPSULES

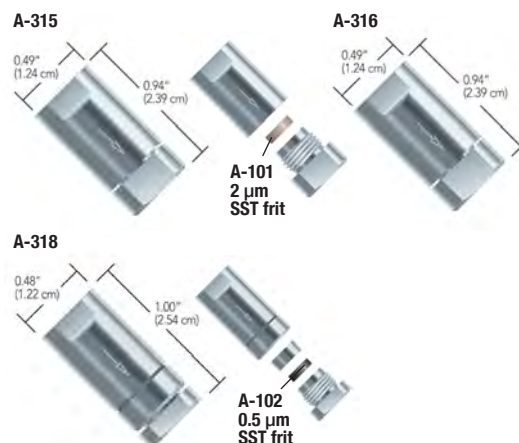
PART NO	DESCRIPTION	POROSITY	FRICT TYPE	FOR USE WITH	SWEPT VOLUME	MATERIAL	QTY
M-121	Filter Capsule	1 µm	SST Screen	M-530 and M-531	85 nL	PEEK	2/pk
M-124	Filter Capsule	2 µm	SST Screen	M-532	85 nL	PEEK	2/pk
M-125	NanoFilter Capsule	1 µm	SST Frit	M-537 and M-538	10 nL	PEEK	2/pk
M-126	NanoFilter Capsule	1 µm	Ti Frit	M-537 and M-538	10 nL	PEEK	2/pk
M-131	Filter Capsule	1 µm	SST Screen	M-543	85 nL	PEEK	2/pk
M-133	NanoFilter Capsule	1 µm	SST Frit	M-547 and M-548	10 nL	PEEK	2/pk
M-134	NanoFilter Capsule	1 µm	Ti Frit	M-547 and M-548	10 nL	PEEK	2/pk
M-128	Conductive NanoFilter Capsule	1 µm	SST Frit	M-534	10 nL	SST/PEEK	2/pk

PRECOLUMN MICROFILTER ASSEMBLIES

PART NO	DESCRIPTION	POROSITY	THREADS	SWEPT VOLUME	PRESSURE RATING	QTY
M-500	MicroFilter Assy, SST Frit	0.5 µm	10-32 Coned	0.5 µL	4,000 PSI (276 bar)	ea
M-510	MicroFilter Assy, PEEK Frit	0.5 µm	10-32 Coned	0.5 µL	4,000 PSI (276 bar)	ea
M-550	MicroFilter Assy, SST Frit	0.5 µm	10-32 Coned	0.5 µL	4,000 PSI (276 bar)	ea
M-560	MicroFilter Assy, PEEK Frit	0.5 µm	10-32 Coned	0.5 µL	4,000 PSI (276 bar)	ea

Standard Precolumn Filters

- ➔ Economical protection for analytical columns in HPLC and UHPLC
- ➔ Traditional versions connect tubing on both sides
- ➔ Direct-connect versions attach to the inlet port of most standard columns

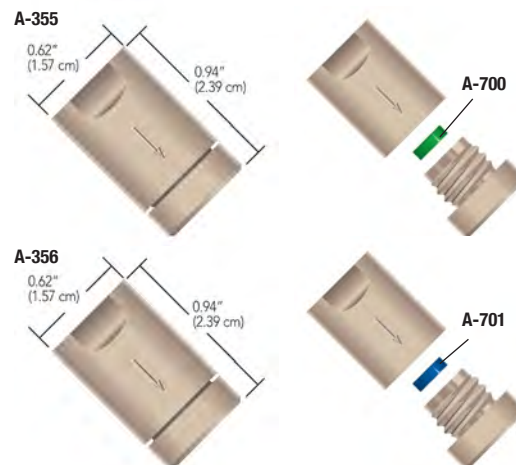


PRECOLUMN FILTERS						
PART NO	DESCRIPTION	POROSITY	THREADS	SWEPT VOLUME	PRESSURE RATING	QTY
REPLACEMENT PRECOLUMN MICROFILTER FRITS (FRIT DIAMETER X FRIT THICKNESS X OVERALL DIAMETER)						
A-735x	PEEK Frits, 0.045" x 0.031" x 0.192"	0.5 µm	N/A	216 nL	N/A	10/pk
C-420	SST Frits, 0.038" x 0.028" x 0.192"	2 µm	N/A	101 nL	N/A	ea
C-425	SST Frits, 0.038" x 0.028" x 0.192"	0.5 µm	N/A	101 nL	N/A	ea
PRECOLUMN FILTERS						
A-315	Solvent Filter Assy	2 µm	10-32 Coned	1.4 µL	6,000 PSI (414 bar)	ea
A-316	Solvent Filter Assy	0.5 µm	10-32 Coned	1.3 µL	6,000 PSI (414 bar)	ea
A-318	Solvent Filter Assy	0.5 µm	10-32 Coned	0.84 µL	6,000 PSI (414 bar)	ea
A-101	Replacement Frits, Stainless Steel	2 µm	—	0.74 µL	N/A	ea
A-102	Replacement Frits, Stainless Steel	0.5 µm	—	0.61 µL	N/A	ea
VHP-550	Precolumn VHP Filter	0.5 µm	10-32 Coned	1.9 µL	20,000 PSI (1,380 bar)	ea
VHP-555	Precolumn VHP Filter	0.2 µm	10-32 Coned	1.8 µL	20,000 PSI (1,380 bar)	ea
VHP-551	Replacement Precolumn VHP Frit Assy	0.5 µm	N/A	1.9 µL	N/A	ea
VHP-556	Replacement Precolumn VHP Frit Assy	0.2 µm	N/A	1.8 µL	N/A	ea

Biocompatible Precolumn Filters

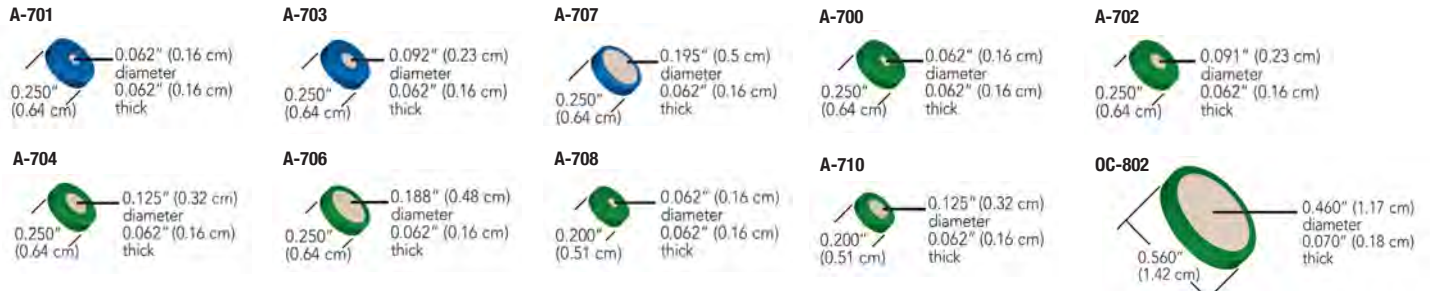
Upchurch Scientific® Biocompatible Precolumn Filters have 0.020" (0.50 mm) diameter thru-holes and 8" distribution cones for minimal band spreading and mixing. The bodies of these filters are manufactured from biocompatible PEEK polymer and are pressure rated to 5,000 PSI (345 bar). These filters are designed for use with 1/16" OD tubing, which can be connected to these filters using standard Fingertight fittings.

BIOCOMPATIBLE PRECOLUMN FILTERS						
PART NO	DESCRIPTION	POROSITY	THREADS	SWEPT VOLUME	PRESSURE RATING	INCLUDES
A-355	Solvent Filter Assy	2 µm	10-32 C	1.4 µL	5,000 PSI (345 bar)	(1) A-700
A-356	Solvent Filter Assy	0.5 µm	10-32 C	1.3 µL	5,000 PSI (345 bar)	(1) A-701
A-700	Replacement Frit, PEEK Polymer, ea.	2 µm	—	0.74 µL	N/A	—
A-701	Replacement Frit, PEEK Polymer, ea.	0.5 µm	—	0.61 µL	N/A	—

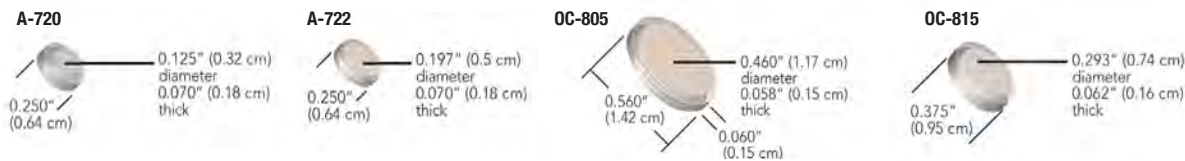


Frits

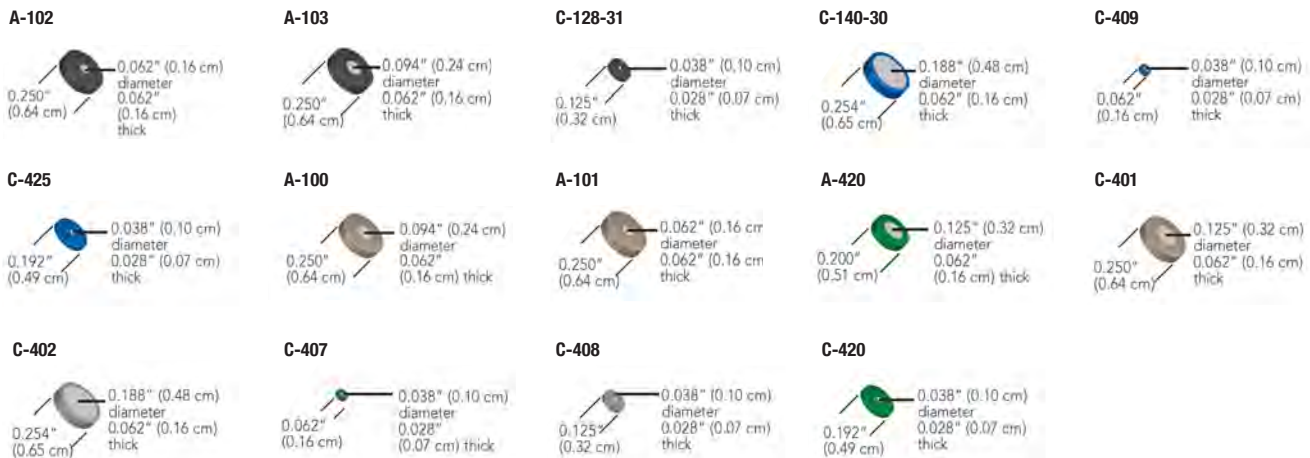
PEEK Frits



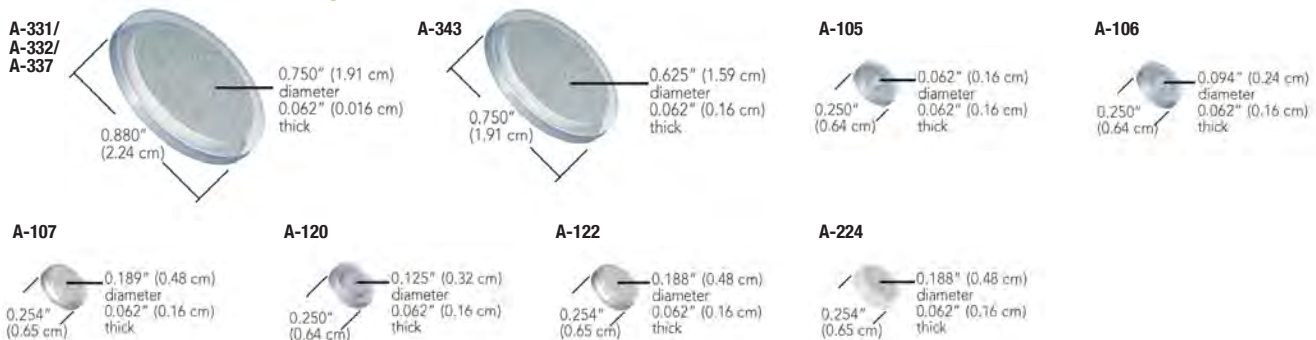
Semi-Prep PEEK Frits



Stainless Steel Frits



Stainless Steel Semi-Prep Frits



Frits (cont.)

PEEK FRITS							
PART NO	POROSITY	DISC DIAMETER	DISC THICKNESS	RING OD	RING MATERIAL	FRIT VOLUME	QTY
A-700	2 µm	0.062" (0.16 cm)	0.62"(0.16 cm)	0.250" (0.64 cm)	PCTFE	0.7 µL	ea
A-701	0.5 µm	0.062" (0.16 cm)	0.62"(0.16 cm)	0.250" (0.64 cm)	PCTFE	0.6 µL	ea
A-702	2 µm	0.091" (0.23 cm)	0.62"(0.16 cm)	0.250" (0.64 cm)	PCTFE	1.7 µL	ea
A-703	0.5 µm	0.092" (0.23 cm)	0.62"(0.16 cm)	0.250" (0.64 cm)	PCTFE	1.4 µL	ea
A-704	2 µm	0.125" (0.32 cm)	0.62"(0.16 cm)	0.250" (0.64 cm)	PCTFE	3.0 µL	ea
A-706	2 µm	0.188" (0.48 cm)	0.62"(0.16 cm)	0.250" (0.64 cm)	PCTFE	7.1 µL	ea
A-707	0.5 µm	0.195" (0.5 cm)	0.62"(0.16 cm)	0.250" (0.64 cm)	PCTFE	6.1 µL	ea
A-708	2 µm	0.062" (0.16 cm)	0.62"(0.16 cm)	0.200" (0.51 cm)	PCTFE	0.7 µL	ea
A-710	2 µm	0.125" (0.32 cm)	0.62"(0.16 cm)	0.200" (0.51 cm)	PCTFE	3.0 µL	ea
SEMI-PREP PEEK FRITS							
OC-802	2 µm	0.460" (1.17 cm)	0.070" (0.18 cm)	0.560" (1.42 cm)	PCTFE	46.4 µL	ea
A-720	10 µm	0.125" (0.32 cm)	0.070" (0.18 cm)	0.250" (0.64 cm)	PCTFE	4.2 µL	ea
A-722	10 µm	0.197" (0.5 cm)	0.070" (0.18 cm)	0.250" (0.64 cm)	PCTFE	9.9 µL	ea
OC-803	10 µm	0.460" (1.17 cm)	0.072" (0.18 cm)	0.560" (1.42 cm)	PCTFE	57.2 µL	ea
OC-805	5 µm	0.460" (1.17 cm)	0.058" (0.15 cm)	0.560" (1.42 cm)	PCTFE	41.1 µL	ea
OC-815	5 µm	0.293" (0.74 cm)	0.062" (0.16 cm)	0.375" (0.95 cm)	PCTFE	17.8 µL	ea
STAINLESS STEEL FRITS							
PART NO	POROSITY	DISC DIAMETER	DISC THICKNESS	RING OD	RING MATERIAL	FRIT VOLUME	QTY
A-100	2 µm	0.094" (0.24 cm)	0.062" (0.16 cm)	0.250" (0.64 cm)	PEEK	1.7 µL	ea
A-101	2 µm	0.062" (0.16 cm)	0.062" (0.16 cm)	0.250" (0.64 cm)	PEEK	0.7 µL	ea
A-102	0.5 µm	0.062" (0.16 cm)	0.062" (0.16 cm)	0.250" (0.64 cm)	PEEK	0.6 µL	ea
A-103	0.5 µm	0.094" (0.24 cm)	0.062" (0.16 cm)	0.250" (0.64 cm)	PEEK	1.4 µL	ea
A-420	2 µm	0.125" (0.32 cm)	0.062" (0.16 cm)	0.200" (0.51 cm)	PCTFE	3.0 µL	ea
C-128-31	0.5 µm	0.038" (0.10 cm)	0.028" (0.07 cm)	0.125" (0.32 cm)	PEEK	0.1 µL	ea
C-140-30	0.5 µm	0.188" (0.48 cm)	0.062" (0.16 cm)	0.254" (0.65 cm)	PCTFE	6.5 µL	ea
C-401	2 µm	0.125" (0.32 cm)	0.062" (0.16 cm)	0.250" (0.64 cm)	PEEK	3.0 µL	ea
C-402	2 µm	0.188" (0.48 cm)	0.062" (0.16 cm)	0.254" (0.65 cm)	PEEK	7.8 µL	ea
C-407	2 µm	0.038" (0.10 cm)	0.028" (0.07 cm)	0.062" (0.16 cm)	PCTFE	0.1 µL	ea
C-408	2 µm	0.038" (0.10 cm)	0.028" (0.07 cm)	0.125" (0.32 cm)	PEEK	0.1 µL	ea
C-409	0.5 µm	0.038" (0.10 cm)	0.028" (0.07 cm)	0.062" (0.16 cm)	PCTFE	0.1 µL	ea
C-420	2 µm	0.038" (0.10 cm)	0.028" (0.07 cm)	0.192" (0.49 cm)	PCTFE	0.1 µL	ea
C-425	0.5 µm	0.038" (0.10 cm)	0.028" (0.07 cm)	0.192" (0.49 cm)	PCTFE	0.1 µL	ea
SEMI-PREP STAINLESS STEEL FRITS							
A-105	10 µm	0.062" (0.16 cm)	0.062" (0.16 cm)	0.250" (0.64 cm)	PCTFE	0.9 µL	ea
A-106	10 µm	0.094" (0.24 cm)	0.062" (0.16 cm)	0.250" (0.64 cm)	PCTFE	2.0 µL	ea
A-107	10 µm	0.189" (0.48 cm)	0.062" (0.16 cm)	0.254" (0.65 cm)	PCTFE	9.1 µL	ea
A-120	20 µm	0.125" (0.32 cm)	0.062" (0.16 cm)	0.250" (0.64 cm)	PCTFE	3.7 µL	ea
A-122	20 µm	0.188" (0.48 cm)	0.062" (0.16 cm)	0.254" (0.65 cm)	PCTFE	9.7 µL	ea
A-224	20 µm	0.188" (0.48 cm)	0.062" (0.16 cm)	0.254" (0.65 cm)	PTFE	9.7 µL	ea
A-331	10 µm	0.750" (1.91 cm)	0.062" (0.16 cm)	0.880" (2.24 cm)	ETFE	141.9 µL	ea
A-332	2 µm	0.750" (1.91 cm)	0.062" (0.16 cm)	0.880" (2.24 cm)	ETFE	141.9 µL	ea
A-337	20 µm	0.750" (1.91 cm)	0.062" (0.16 cm)	0.880" (2.24 cm)	ETFE	152 µL	ea
A-343	2 µm	0.625" (1.59 cm)	0.062" (0.16 cm)	0.750" (1.91 cm)	PCTFE	112.6 µL	ea

Guard Columns

Unpacked Semi-Prep Guard Column

- ➔ 10 mm ID column protection
- ➔ Convenient cartridge system
- ➔ Easy to pack



The internal volume of this semi-prep guard column is just 780 μL , which only requires approximately 1.50 g of packing material—ideally the same material used in your semi-prep column. The C-1000 Holder will hold to high pressures, and is specially treated to prevent galling.* Use standard 10-32 coned fittings (not included) to connect your 1/16" OD tubing.

Cartridge Guard Columns

Insert one of these Upchurch Scientific® analytical guard columns between the injection valve and column of your HPLC system to extend the life of your column and help ensure reproducible results. Convenient, pre-packed PEEK polymer cartridges complete the system and are available in a variety of bonded phases to match your column chemistry held in place by Titanium frits. The C-270 Stainless Steel Guard Column Holder is engineered for high-pressure applications to 4,000 PSI (276 bar). Each of these holders are surface treated to prevent galling*, a potential problem with threaded metal parts.



**Galling is a form of "cold welding". When two fittings manufactured from the same metal are wrench-tightened too tightly, they can "weld" together, making it virtually impossible to separate the two components.*

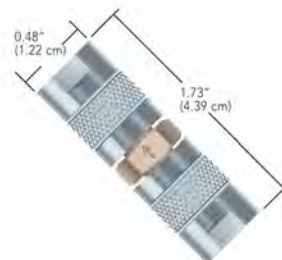
GUARD COLUMNS		
PART NO	DESCRIPTION	QTY
SEMI-PREP GUARD COLUMN (10 mm ID x 1 cm)		
C-1000	Semi-Prep Cartridge Guard Column Holder	ea
C-1035	Semi-Prep Cartridge	ea
CARTRIDGE GUARD COLUMN KITS		
C-281	2.0 mm ID C18 Cartridges (6/pk) with (1) C-270 Assy	6/pk
C-751	4.3 mm ID C18 Cartridges (6/pk) with (1) C-270 Assy	6/pk
GUARD COLUMN CARTRIDGE HOLDERS, BIOCOMPATIBLE		
C-270	High Pressure, Stainless Steel with (2) F-200 Fittings	ea
GUARD COLUMN CARTRIDGE HOLDERS, BIOCOMPATIBLE		
C-282	2.0 mm ID x 1 cm, 10 μm Silica Reversed Phase C18	10/pk
C-752	4.3 mm ID x 1 cm, 5 μm Silica Reversed Phase C18	10/pk

TECH TIP | Additional Guard Columns

Find more guard columns in the HPLC columns section (Almost every brand and phase will have its own unique guard column).

Microbore Guard Columns

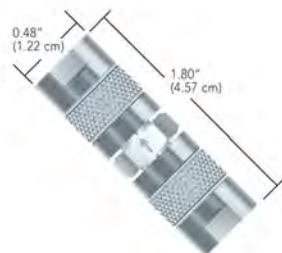
This ultralow volume guard column (1.0 mm ID x 2 cm length) is ideal for narrow-bore chromatography. The unpacked guard column allows you to exactly match the chemistry of your column, resulting in optimum column protection. The total packing volume of 16.2 μL ensures maximum column efficiency and analytical column protection.



Frits often become plugged before a guard column is contaminated. The two 0.5 μm frits included with this guard column can be changed in minutes. Optional 2 μm frits may be purchased separately (C-408).

Analytical Guard Columns

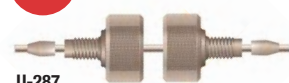
HPLC users find this column easy to pack and extremely economical. This narrow-bore short column (2.0 mm ID x 2 cm length) creates only a slight pressure increase with virtually no detectable theoretical plate loss when used with a 3 mm ID or larger column. The 2 μm frits are easy to change, prolonging the life of the guard column. With only 62 μL packing volume per guard column, a 3 g bottle of packing material will pack about 30 guard columns.



GUARD COLUMNS			
PART NO	DESCRIPTION	INCLUDES	QTY
MICROBORE GUARD COLUMNS (1.0 mm ID x 2 cm UNPACKED)			
C-128	Guard Column	(2) C-128-31	ea
C-128-31	0.5 μm Stainless Steel Replacement Frit		ea
C-408	2 μm Stainless Steel Replacement Frit		ea
C-128-40	Slurry Packing Adapter		ea
ANALYTICAL GUARD COLUMNS (2.0 mm ID x 2 cm UNPACKED)			
C-130B	Guard Column	(2) A-100	ea
C-130-20	Packing Funnel		ea
A-103	0.5 μm Stainless Steel Replacement Frit		ea
A-100	2 μm Stainless Steel Replacement Frit		ea
C-130-40	Slurry Packing Adapter		ea



CHROM TECH RELATED PRODUCTS



U-287



U-284

PART NO	DESCRIPTION	QTY
U-287	PEEK male column coupler, 10-32 C, 0.010", 3.6 μL	ea
U-284	Delrin/SS male column coupler, 10-32 C, 0.007", 1.3 μL	ea

Capillary Sample Trap Columns

- ➔ Packed and unpacked columns
- ➔ Pressure rated to 5,000 PSI (345 bar)
- ➔ Direct connect 360 µm OD capillary tubing

Upchurch Scientific Capillary Sample Trap Columns are ideal for separating and concentrating and/or purifying biological samples.

Capillary Sample Trap Column Assemblies include one or more 1 µm NanoFilter™ Capsules, each containing either a stainless steel (SST) or biocompatible titanium (Ti) frit. The swept volume of these unique filters is only 10 nL each. Connect your 360 µm OD capillary tubing directly to our Sample Trap Column Assemblies using the fittings provided. The maximum flow rate for these products is 10 µL/min; 250 nL is the optimal flow rate.

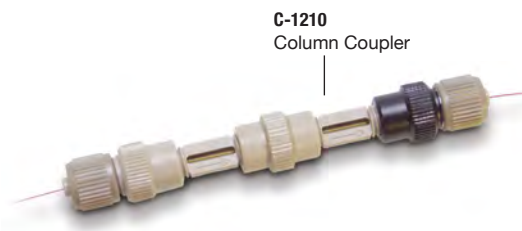


C-1300

Please Note: Reversing flow in these columns can result in loss of packing material. For more information regarding the proper setup involving these Sample Trap Columns, please contact Chrom Tech customer service.

SAMPLE TRAP COLUMNS ASSEMBLIES			
PART NO	DESCRIPTION	FRICT MATERIAL	INCLUDES
C-1300	C18 Column	Ti	(1) 2/pk C-1250, (1) M-126, (2) P-416BLK, (2) F-152, (1) M-124NF
C-1600	Unpacked Column	Ti	(1) FS-1000-25, (2) M-126, (2) P-416BLK, (2) F-152

COLUMN COUPLER & REPLACEMENT PARTS			
PART NO	DESCRIPTION	SWEPT VOL	QTY
C-1210	Column Coupler, PEEK	—	ea
F-152	MicroFerrule for 360 µm OD tubing, PEEK	—	ea
M-124NF	Capsule Union, no Frit, PEEK	9.5 nL	ea
M-125	1 µm NanoFilter Capsules, with SST Frits	10 nL	2/pk
M-126	1 µm NanoFilter Capsules, with Ti Frits	10 nL	2/pk
P-416	Female Nut, Natural PEEK	—	ea
P-416BLK	Female Nut, Black PEEK	—	ea
P-416G	Female Nut, Green PEEK	—	ea



Agilent AdvanceBio Desalting-RP Cartridges

- ➔ Perform MS detection with traditionally non-MS methodologies—such as IEX, SEC, and affinity chromatography
- ➔ Save time by desalting your samples online
- ➔ Reduce downtime and maintenance by eliminating salt in your MS
- ➔ Improve data quality and confidence in your results

AdvanceBio Desalting-RP cartridges are ideally suited for reversed-phase desalting before MS detection. Cartridges feature a 10 µm polymeric reversed-phase particle with 1000 Å pore size and are stable from pH 2–13. They are compatible with all commonly used reversed-phase mobile phases.

AGILENT ADVANCEBIO DESALTING-RP CARTRIDGES

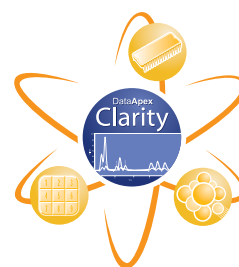
PART NO	DESCRIPTION
PL1612-1102	AdvanceBio Desalting-RP, 2.1 x 12.5 mm, 3/pk
820999-901	Cartridge holder



Characterizing complex proteins—including monoclonal antibodies—requires multiple techniques, such as affinity, ion exchange, and size exclusion chromatography. However, the mobile phases used for these techniques are aqueous-based and contain nonvolatile salts, which can cause signal suppression during MS detection. Perform reversed-phase removal of salt ions—online—before MS detection.

HPLC Instrumentation

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CATALYST FOR SUCCESS

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2, 4 and 8 Channel available

312 Detectors



317 ISCO Foxy® R1 & R2 Fraction Collectors



318 DataApex Clarity Chromatography Software



- Competitive pricing & free software updates
- Direct control of many chromatography instruments

320 Pickering Post Column Reactors



Notes from the Support Desk

DataApex Clarity Chromatography Software

Merging equipment from two labs?

Inherited legacy instrumentation?

Have multi-vendor chromatography instrumentation in the lab?

Is your IT Department requiring your lab to upgrade to a current operating system, but, your chromatography software is not compatible?

If you answered yes to any of these, contact Chrom Tech to learn about DataApex Clarity Chromatography Software to Control and Collect Data from multiple instrument vendors.

Single Analysis Sequence Tab Information Table

The screenshot shows the DataApex Clarity software interface. At the top, there are three tabs: 'Single Analysis', 'Sequence Tab', and 'Information Table'. The main window displays a menu bar (File, Monitor, Analysis, Method, Setting, View, Window, Help) and a central panel with a schematic diagram of a chromatography system. The schematic includes a pump, a detector, and a reactor. Callouts point to various parts of the interface: 'Settings of directly controlled equipment' points to the pump icon; 'Monitoring of the signal from detectors' points to the detector icon; 'Method setup Integration parameters' points to the 'Method' menu; 'Method setup calibrated calculations' points to the 'Analysis' menu; 'Chromatogram review and modify already measured chromatogram' points to a chromatogram icon; 'Calibration use sample as calibration standard (calibrate or recalibrate)' points to a calibration icon; and 'Print customized reports from the analysis' points to a printer icon. The status bar at the bottom shows 'For Help, press F1', 'DEMO4', and 'Administrator'.

NEW! Next Generation Pumps Replaces Chrom Tech Legacy Pumps

TECH TIP

Pump accessory kit shipped with all pumps includes:
 1/8" OD PTFE tubing (36" length)
 20 µm inlet filter
 Outlet tubing sold separately:
 1/16" OD PEEK tubing (pg 253)
 1/16" OD SS tubing (pg 257)



REPLACES	Series I, ISO-100	Series I, ISO-100	Series I+, ISO-100+	Series II, ISO-1000	Series III, ISO-2000
Max flow rate/pressure	10 mL/2,000 PSI 40 mL/500 PSI	10 mL/5,000 PSI 40 mL/900 PSI	10 mL/5,000 PSI 40 mL/900 PSI	5 mL/6,000 PSI 10 mL/6,000 PSI 40 mL/1,600 PSI	5 mL/6,000 PSI 10 mL/6,000 PSI 40 mL/1,600 PSI
Page	297	298	298	299	299
Inlet: 1/8" OD, 1/4-28 Flat bottom	●	●	●	●	●
Outlet: 1/16" OD, 10-32	●	●	●	●	●
FEATURES					
3 year warranty	●	●	●	●	●
Single piston isocratic pump	●	●	●	●	●
Simple keypad control, LED display	●	●	●	●	●
Self-flushing pump heads	●	●	●	●	●
Pulse dampener			●	●	●
Prime purge valve		●	●	●	●
Real-time pressure monitoring			●		●
Set upper and lower pressure limits			●		●
Drip tray and leak sensor		Drip tray only	●	Drip tray only	●



REPLACES	Dual Piston, 1500 Series	Prep 100, Prep 300	UHP	Constant Pressure	B2300
Max flow rate/pressure	12 mL/6,000 PSI 36 mL/6,000 PSI 100 mL/1,000 PSI	100 mL/4,000 PSI 300 mL/1,000 PSI	5 mL/18,000 PSI	5 mL/25,000 PSI 12 mL/18,000 PSI 24 mL/10,000 PSI 100 mL/5,000 PSI 300 mL/1,000 PSI	5 mL/6,000 PSI 10 mL/6,000 PSI 40 mL/1,600 PSI
Page	300	300	301	302	303
Inlet: 1/8" OD, 1/4-28 Flat bottom	●	● 1/4" OD (300 mL)	●	● 1/4" OD (300 mL)	●
Outlet: 1/16" OD, 10-32	● 1/8" OD (100 mL)	● 1/8" OD (100 & 300 mL)	●	● 1/8" OD (100 & 300 mL)	●
FEATURES					
3 year warranty	●	●	●	●	●
Dual piston isocratic pump	●	●	●	●	●
Simple keypad control, LED display	●	●	●	●	●
Self-flushing pump heads	●	●	●	●	●
Pulse dampener	●	●	●	●	●
Prime purge valve	●	●	●	●	●
Real-time pressure monitoring	●	●	●	●	●
Set upper and lower pressure limits	●	●	●	●	●
Drip tray and leak sensor	●	●	●	●	●

Low Profile Single Piston Isocratic Pump | M1 Class

- ➔ Self-flushing pump head
- ➔ Stainless steel or PEEK fluid path
- ➔ Simple keypad controls, LED display
- ➔ Single piston
- ➔ Electronic rapid refill mechanism
- ➔ Motor stall detector
- ➔ 3 year warranty

The compact M1 Class consists of single-headed, positive displacement piston pumps that deliver high-performance and precision at an affordable price. Applications include precise chemical metering, dispensing, and specific HPLC separation. Having the smallest possible footprint for a high pressure pump, the M1 Class will easily integrate into any laboratory or industrial environment.



Replaces Series I, ISO-100



SPECIFICATIONS		
Flow Accuracy	Within 2% of set flow rate*	10 mL
	Within 5% of set flow rate*	40 mL
Flow Precision	1.0% RSD	
Wetted Materials	Synthetic Ruby, Sapphire, UHMWPE, PTFE	
Dimensions (h x w x d)	5.5" x 3" x 10.5" (14 x 8 x 27 cm)	
Weight	3.5 lbs (1.6 kg)	
Power	To Supply: 100-240 VAC, 50-60 Hz, 1A Supply to Pump: 24VDC, center positive, 2.1 mm post, 1.6 AMP	
Control	Micro USB Port with RS-232 communication, Run/Stop	

*Flow rate range for flow accuracy specification:

10 mL—0.20 mL/min and above; 80:20 Water/IPA at 1,000 PSI
40 mL—0.80 mL/min and above; 80:20 Water/IPA at 100 PSI

ORDERING INFORMATION					
PART NO	SEAL TYPE	FLOW RATE (mL/min)	MATERIAL	PRESSURE (PSI)	PUMP HEAD
P-M110S	standard	10.00	SS	2,000	MM
P-M110B	standard	10.00	PEEK	2,000	MM
P-M110S-O	organic	10.00	SS	2,000	MM
P-M110B-O	organic	10.00	PEEK	2,000	MM
P-M140S	standard	40.0	SS	500	MH
P-M140B	standard	40.0	PEEK	500	MH
P-M140S-O	organic	40.0	SS	500	MH

Flow Rate is dependent on solvent selection and operating pressure



Clarity Software Compatible
See page 318

TECH TIP

Standard vs Organic Seals

The standard seal is made of (UHMW-PE) Ultra High Molecular Weight Polyethylene for use with aqueous fluids. The organic seal is made of graphite-filled PTFE for use with harsh chemicals.

TECH TIP

The recommended minimum back pressure is 200 PSI for optimum pump performance. If your application will not provide adequate back pressure, adding restrictive tubing to the outlet of the pump is recommended.

REPLACEMENT PARTS	MM HEAD		MH HEAD	
	P-M110S	P-M110B	P-M140S	P-M140B
Piston Seal Kit*, Aqueous	P-0103	P-0103B NEW!	P-1295	P-1295B NEW!
Piston Seal Kit*, Organic	P-0109	P-0109B NEW!	P-1299	—
Check Valve Kit, Inlet & Outlet	P-1085-2	P-1086	P-1085-2	P-1086
Repl Check Valve Capsules, 10/pk	P-1075	P-1076	P-1075	P-1076
Self-Flush Assembly	P-1082	P-1088	P-1081	P-1089
Replacement Piston	P-0101	P-0101	P-1298	P-1298
Inlet Filter Assy (Fitting & Element)	06-0110	06-0110	06-0110	06-0110
Repl Inlet Filter Elements, 2/pk	P-1170	P-1170	P-1170	P-1170

*Seal Kits include: Self-flush seal, O-Ring, Primary Seal, and Removal Tool



Biocompatible Seals
Now offering biocompatible seals which contain a fluoropolymer energizer (vs the Stainless Steel Energizer)

Single Piston Isocratic Pump | ML & MXT Class

- ➔ Pressure monitoring with automatic pressure compensation
- ➔ Integrated prime-purge valve
- ➔ Stainless steel or PEEK fluid path
- ➔ Simple keypad controls, LED display
- ➔ Leak sensor
- ➔ 3 year warranty
- ➔ MXT-MS Applications include

- Flow Injection Analysis
- Infusion
- Cone Wash



Clarity Software Compatible
See page 318



ML Replaces Series 1, ISO-100
MXT Replaces Series 1+, ISO-100+

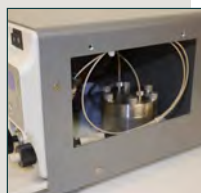


SPECIFICATIONS		
Flow Accuracy	Within 2% of set flow rate* Within 5% of set flow rate*	10 mL 40 mL
Pressure Accuracy	± 2% of full scale pressure	
Flow Precision	0.5% RSD	
Wetted Materials	Synthetic Ruby, Sapphire, UHMWPE, PTFE	
Dimensions (h x w x d)	6.5" x 7" x 16" (17 x 18 x 41 cm)	
Weight	15.3 lbs (6.9 kg)	
Power	100-240 VAC, (± 10%), 50-60 Hz	
Control	RS-232, Micro USB, Voltage Flow Control, Run/Stop (ML Class: Micro USB & Run/Stop)	

*Flow rate range for flow accuracy specification:
10 mL—0.20 mL/min and above; 80:20 Water/IPA at 1,000 PSI
40 mL—0.80 mL/min and above; 80:20 Water/IPA at 100 PSI

TECH TIP

The MXT-MS pump includes an internal backpressure coil assembly (max flow rate of 1 mL/min) for mass spectrometry applications, i.e.: Flow Injection analysis, Infusion, Cone Wash.



ML & MXT ORDERING INFORMATION					
PART NO ML MODEL	PART NO MXT MODEL	FLOW RATE (mL/min)	MATERIAL	PRESSURE (PSI)	PUMP HEAD
P-ML10S	P-MXT10S	10.00	SS	5,000	MM
P-ML10B	P-MXT10B	10.00	PEEK	5,000	MM
P-ML40S	P-MXT40S	40.0	SS	900	MH
P-ML40B	P-MXT40B	40.0	PEEK	900	MH
MXT-MS ORDERING INFORMATION					
—	P-MXT01B-MS	1.000	PEEK	5,000	MM

Flow Rate is dependent on solvent selection and operating pressure

ML MODEL	MXT MODEL	FEATURES
X	X	Self-flushing pump heads & prime purge valve
	X	Real-time pressure monitoring
	X	Set upper and lower pressure limits
X	X	Drip tray
	X	Leak sensor on drip tray
X	X	Pulse dampener
X	X	Run/Stop
X	X	Micro USB with RS-232 communication
	X	RJ11 with RS-232 communication
	X	Voltage control

REPLACEMENT PARTS	MM HEAD		MH HEAD	
	P-ML10S P-MXT10S	P-ML10B P-MXT10B/P-MXT01B-MS	P-ML40S P-MXT40S	P-ML40B P-MXT40B
Piston Seal Kit*, Aqueous	P-0103	P-0103B NEW!	P-1295	P-1295B NEW!
Piston Seal Kit*, Organic	P-0109	P-0109B NEW!	P-1299	—
Check Valve Kit, Inlet & Outlet	P-1085-2	P-1086	P-1085-2	P-1086
Repl Check Valve Capsules, 10/pk	P-1075	P-1076	P-1075	P-1076
Self-Flush Assembly	P-1082	P-1088	P-1081	P-1089
Replacement Piston	P-0101	P-0101	P-1298	P-1298
Inlet Filter Assy (Fitting & Element)	06-0110	06-0110	06-0110	06-0110
Repl Inlet Filter Elements, 2/pk	P-1170	P-1170	P-1170	P-1170
Repl Outlet Filter Elements, 2/pk	P-1175	P-1171 (ea)	P-1175	P-1171 (ea)
Pulse Dampener Rebuild Kit	P-1063	P-1063	P-1063	P-1063
MXT Backpressure Coil Assy for MS applications	—	P-COIL	—	—

*Seal Kits include: Self-flush seal, O-Ring, Primary Seal, and Removal Tool



Biocompatible Seals

Now offering biocompatible seals which contain a fluoropolymer energizer (vs the Stainless Steel Energizer)

Single Piston High Performance Isocratic Pump | LS & LST Class

- ➔ Pulse dampener
- ➔ Self-flushing pump heads and prime purge valve
- ➔ Stainless steel or PEEK fluid path
- ➔ Simple front panel keypad controls with LED display
- ➔ 3 year warranty
- ➔ Additional features of LST models
 - Real-time pressure monitoring
 - Set upper and lower pressure limits
 - Drip tray and leak sensor



LS Replaces Series II, ISO-1000
LST Replaces Series III, ISO-2000



The reliable LS/LST Class consists of single-headed positive displacement piston pumps incorporating advanced cam designs for very low pulsation. With micro-stepping motor technology and a proven single-piston pump mechanism, the LS/LST Class exceeds the performance of more expensive units at a fraction of the cost. The pumps are ideal for a wide variety of HPLC applications (including biocompatible separations), semi-prep LC, metering & dispensing, and general lab use.

Clarity Software Compatible
See page 318

SPECIFICATIONS	
Flow Accuracy	Within 2% of set flow rate*
Pulsation	≤ 2% at 1 mL/min and 1,000 PSI
Pressure Accuracy	± 2% of full scale pressure
Flow Precision	0.2% RSD
Wetted Materials	Synthetic Ruby, Sapphire, UHMWPE, PTFE
Dimensions (h x w x d)	6.5" x 7" x 16" (16.5 x 18 x 41 cm)
Weight	15 lbs (7 kg)
Power	100-240 VAC (± 10%), 50-60 Hz
Control	RS-232, Micro USB, Voltage Flow Control, Run/Stop (LL Class: Micro USB & Run/Stop)

*Flow rate range for flow accuracy specification:
5 mL and 10 mL—0.20 mL/min and above; 80:20 Water/IPA at 1,000 PSI
40 mL—0.80 mL/min and above; 80:20 Water/IPA at 100 PSI

TECH TIP

The recommended minimum back pressure is 200 PSI for optimum pump performance. If your application will not provide adequate back pressure, adding restrictive tubing to the outlet of the pump is recommended.

ORDERING INFORMATION						
PART NO LL MODEL	PART NO LS MODEL	PART NO LST MODEL	FLOW RATE (mL/min)	MATERIAL	PRESSURE (PSI)	PUMP HEAD
P-LL05S	P-LS05S	P-LST05S	5.000	SS	6,000	L
P-LL05B	P-LS05B	P-LST05B	5.000	PEEK	6,000	L
P-LL10S	P-LS10S	P-LST10S	10.00	SS	6,000	M
P-LL10B	P-LS10B	P-LST10B	10.00	PEEK	6,000	M
P-LL40S	P-LS40S	P-LST40S	40.0	SS	1,600	H
P-LL40B	P-LS40B	P-LST40B	40.0	PEEK	1,600	H

Flow Rate is dependent on solvent selection and operating pressure

LL MODEL	LS MODEL	LST MODEL	FEATURES
X	X	X	Pulse dampener
X	X	X	Self-flushing pump heads & prime purge valve
		X	Real-time pressure monitoring
		X	Set upper and lower pressure limits
X	X	X	Drip tray
		X	Leak sensor on drip tray
X	X	X	Run/Stop
X	X	X	Micro USB with RS-232 communication
	X	X	RJ11 with RS-232 communication
	X	X	Voltage control

REPLACEMENT PARTS	L HEAD		M HEAD		H HEAD	
	P-LL05S/P-LS05S/ P-LST05S	P-LL05B/ P-LS05B/ P-LST05B	P-LL10S/ P-LS10S/ P-LST10S	P-LL10B/ P-LS10B/ P-LST10B	P-LL40S/ P-LS40S/ P-LST40S	P-LL40B/ P-LS40B/ P-LST40B
Piston Seal Kit*, Aqueous	P-1595	P-1595B NEW!	P-1095	P-1095B NEW!	P-1096	P-1096B NEW!
Piston Seal Kit*, Organic	P-1599	—	P-1099	P-1099B NEW!	P-3009	—
Check Valve Kit, Inlet & Outlet	P-1085-2	P-1086	P-1085	P-1086	P-1085	P-1086
Repl Check Valve Capsules, 10/pk	P-1075	P-1076	P-1075	P-1076	P-1075	P-1076
Self-Flush Check Valve Kit	P-1084	P-1084	P-1084	P-1084	P-1084	P-1084
Replacement Piston	P-1597	P-1597	P-1097	P-1097	P-1198	P-1198
Inlet Filter Assy (Fitting & Element)	06-0110	06-0110	06-0110	06-0110	06-0110	06-0110
Repl Inlet Filter Elements, 2/pk	P-1170	P-1170	P-1170	P-1170	P-1170	P-1170
Repl Outlet Filter Elements, 2/pk	P-1175	P-1171 (ea)	P-1175	P-1171 (ea)	P-1175	P-1171 (ea)
Pulse Dampener Rebuild Kit	P-1063	P-1063	P-1063	P-1063	P-1063	P-1063

*Seal Kits include: Self-flush seal, O-Ring, Primary Seal, and Removal Tool

NEW! **Biocompatible Seals**
Now offering biocompatible seals which contain a fluoropolymer energizer (vs the Stainless Steel Energizer)

Dual Piston Isocratic Pump | LD & PR Class

- ➔ Autoprime™ one button toggles flowrate to maximum for rapid solvent change
- ➔ Real-time pressure monitoring with upper and lower pressure limits
- ➔ Drip tray and leak sensor
- ➔ Pulse dampener
- ➔ Self-flushing pump heads and prime purge valve
- ➔ Stainless steel or PEEK fluid path
- ➔ Simple front panel keypad controls with LED display
- ➔ 3 year warranty



LD Replaces
Dual Piston, 1500 Series
PR Replaces
Prep 100, Prep 300



Clarity Software Compatible
See page 318



SPECIFICATIONS

Flow Accuracy	Within 2% of set flow rate*	LD 12
	Within 2% of set flow rate*	LD 36
	Within 2% of set flow rate*	LD 100
	Within 3% of set flow rate*	PR 100
	Within 4% of set flow rate*	PR 300
Pulsation	≤ 0.5% at 1 mL/min and 1,000 PSI	LD 12
	≤ 2% at 1 mL/min and 1,000 PSI	LD 36
	≤ 4% at 50 mL/min and 250 PSI	LD 100
	≤ 4% at 50 mL/min and 500 PSI	PR 100
	≤ 4% at 50 mL/min and 500 PSI	PR 300
Pressure Accuracy	± 2% of full scale pressure	
Flow Precision	0.2% RSD (12 mL)	
	0.5% RSD (36 mL, 100 mL, 300 mL)	
Wetted Materials	Synthetic Ruby, Sapphire, UHMWPE, PTFE, Ceramic	
Dimensions (h x w x d)	6.5" x 10" x 17" (16 x 25 x 43 cm)	
Weight	30 lbs (14 kg)	
Power	100-240 VAC (± 10%), 50-60 Hz	
Control	RS-232, Micro USB, Voltage Flow Control, Run/Stop	

*Flow rate range for flow accuracy specification:

LD 12—0.200 mL/min and above; 80:20 Water/IPA at 1,000 PSI
LD 36—0.80 mL/min and above; 80:20 Water/IPA at 1,000 PSI
LD 100—2.0 mL/min and above; 80:20 Water/IPA at 1,000 PSI
PR 100—2.0 mL/min and above; 80:20 Water/IPA at 1,000 PSI
PR 300—5.0 mL/min and above; 80:20 Water/IPA at 100 PSI

ORDERING INFORMATION

PART NO	SEAL TYPE	FLOW RATE (mL/min)	MATERIAL	PRESSURE (PSI)	PUMP HEAD	TUBING OUTLET
P-LD12S	standard	12.000	SS	6,000	M	1/16" OD
P-LD12S-O	organic	12.000	SS	6,000	M	1/16" OD
P-LD12B	standard	12.000	PEEK	6,000	M	1/16" OD
P-LD36S	standard	36.00	SS	6,000	M	1/16" OD
P-LD36B	standard	36.00	PEEK	6,000	M	1/16" OD
P-LD100S-8	standard	100.0	SS	1,000	H	1/8" OD
P-LD100B-8	standard	100.0	PEEK	1,000	H	1/8" OD
P-PR100S-8	standard	100.0	SS	4,000	H	1/8" OD
P-PR100S-O-8	organic	100.0	SS	4,000	H	1/8" OD
P-PR100B-8	standard	100.0	PEEK	4,000	H	1/8" OD
P-PR300S-8*	standard	300.0	SS	1,000	XH	1/8" OD

*Does not come equipped with pulse dampener. 1/4" OD inlet (vs 1/8" OD).
Flow Rate is dependent on solvent selection and operating pressure

TECH TIP

Dual Piston Pump Maintenance

In order to do maintenance on a dual piston pump, kits are sold per head, quantity two required.

REPLACEMENT PARTS

	M HEAD		H HEAD		XH HEAD
	P-LD12S P-LD36S	P-LD12B P-LD36B	P-LD100S P-PR100S	P-LD100B P-PR100B	P-PR300S
■ Piston Seal Kit*, Aqueous	P-1095	P-1095B NEW!	P-1096	P-1096B NEW!	P-1795
■ Piston Seal Kit*, Organic	P-1099	P-1099B NEW!	P-3009	—	—
■ Check Valve Kit, Inlet & Outlet	P-1085	P-1086	P-1085	P-1086	P-1781
Repl Check Valve Capsules, 10/pk	P-1075	P-1076	P-1075	P-1076	P-1785 (4/pk)
■ Self-Flush Check Valve Kit	P-1084	P-1084	P-1084	P-1084	P-1084
■ Replacement Piston	P-1097	P-1097	P-1198	P-1198	P-1798
Inlet Filter Assy (Fitting & Element)	06-0110	06-0110	06-0110	06-0110	06-0110
Repl Inlet Filter Elements, 2/pk	P-1170	P-1170	P-1170	P-1170	P-1170
Repl Outlet Filter Elements, 2/pk	P-1175 (0.5 µm) ¹ P-1172 (2 µm) ²	P-1171 (ea)	P-1172	P-1171 (ea)	P-1172
Pulse Dampener Rebuild Kit	P-1063	P-1063	P-1063	P-1063	P-1063

1) 0.5 µm outlet filter element standard with 12 mL pump

2) 2 µm outlet filter element standard with 36 mL pump

*Seal Kits include: Self-flush seal, O-Ring, Primary Seal, and Removal Tool

NEW!

Biocompatible Seals

Now offering biocompatible seals which contain a fluoropolymer energizer (vs the Stainless Steel Energizer)

Ultra High Pressure Isocratic Pump | LU Class

- ➔ Self-flushing pump head
- ➔ Real-time pressure monitoring with upper and lower pressure limits
- ➔ Drip tray and leak sensor
- ➔ Pulse dampener
- ➔ Simple keypad controls, LED display
- ➔ Advanced solvent select feature
- ➔ Automatic pressure compensation
- ➔ 3 year warranty



Replaces UHP pump



The analytical LU Class consists of dual-headed, positive displacement piston pumps, delivering accurate flow rates at extremely high pressures. The pumps are designed for fast, high pressure analytical HPLC, with increased peak resolution and exceptional retention time repeatability. The advanced solvent select feature provides very accurate flow rates at high pressures for a wide variety of solvents, particularly where compressibility is a major factor. With pulse-free performance and precise control, the LU Class provides the highest flow accuracy over the entire pressure range.

SPECIFICATIONS

Flow Accuracy	Within 1% of set flow rate*
Pulsation	≤ 0.75% from 3,000 PSI – 8,000 PSI
Pressure Accuracy	± 2% of full scale pressure
Flow Resolution	0.001 mL
Flow Precision	0.5% RSD on > 30 sec. average flows
Wetted Materials	Synthetic Ruby, Sapphire, UHMWPE, PTFE
Dimensions (h x w x d)	6.5" x 10" x 17" (16 x 25 x 43 cm)
Weight	27 lbs (12 kg)
Power	100-240 VAC (± 10%), 50-60 Hz
Control	RS-232, Micro USB, Voltage Flow Control, Run/Stop

*Flow rate range for flow accuracy specification:
0.100 mL/min and above; 80:20 Water/IPA at 5,000 PSI

ORDERING INFORMATION

PART NO	MAX FLOW RATE	MATERIAL	MAX PRESSURE
P-LU05S	5.000 mL/min	SS	18,000 PSI

Flow Rate is dependent on solvent selection and operating pressure

REPLACEMENT PARTS

Seal Kit*, UHP	P-1895
Check Valve Kit, double inlet/single outlet	P-1885
Repl Check Valve Capsules, 10/pk	P-1875
Self-Flush Check Valve Kit	P-1084
UHP Piston	P-1897
Inlet Filter Assy (Fitting & Element)	06-0110
Repl Inlet Filter Elements, 2/pk	P-1170
Repl Outlet Filter Elements, 2/pk	P-1175

*Seal Kits include: Self-flush seal, O-Ring, Primary Seal, and Removal Tool

TECH TIP

Solvent Select Feature

Differences in solvent compressibility factors can greatly influence flow accuracy, especially at ultra-high system pressures. The Solvent Select Feature optimizes pump performance with six preset compressibility settings for common solvents. For uncommon applications, an isothermal compressibility factor may be entered directly to assure accurate solvent delivery.



Clarity Software Compatible
See page 318

Constant Pressure Isocratic Pump | CP Class

- ➔ Pressure monitoring with automatic pressure compensation
- ➔ Self-flushing pump heads and integrated prime-purge valve
- ➔ Stainless steel or PEEK fluid path
- ➔ Simple keypad controls, LED display
- ➔ 3 year warranty

The CP Class pumps are widely used for LC Column packing, as well as many process applications. Advanced pressure control algorithms ensure consistent bed density and prevent pressure over-shoot by allowing the user to select a wide range of process parameters, including desired pressure set point, ramp rate, and upper flow rate limit. Control software included. Pressure Control Accuracy is dependent on hydraulic system parameters. Pump automatically adjusts fluid flow to maintain constant system pressure under typical column-packing usage. Pump does not contain an automatic pressure-relief valve.



Replaces Constant Pressure pump



SPECIFICATIONS

Pressure Accuracy	± 2% of full scale pressure
Wetted Materials	Synthetic Ruby, Sapphire, UHMWPE, PTFE, Ceramic
Dimensions (h x w x d)	6.3" x 10" x 17" (16 x 25.5 x 43 cm)
Weight	30 lbs (14 kg)
Power	100-240 VAC, (± 10%), 50-60 Hz
Control	RS-232, Micro USB, Voltage Flow Control, Run/Stop

ORDERING INFORMATION

PART NO	FLOW RATE (mL/min)	MATERIAL	MAX PRESSURE (PSI)	PUMP HEAD MODEL
P-CPU05S	5.000	SS	25,000	XUHP
P-CP12S	12.00	SS	10,000	L
P-CPU12S	12.00	SS	18,000	UHP
■ P-CPU12S-PIAB	12.00	SS	18,000	UHP
P-CP24S	24.00	SS	10,000	M
■ P-CP24S-NF-PIAB	24.00	SS	10,000	M
P-CP100S-8	100.0	SS	4,000	H
P-CP300S-8	300.0	SS	1,000	XH

Flow rate is dependent on solvent selection and operating pressure

Complete Pack in a Box (PIAB Models) system includes:

- ➔ Next Generation CP Class Constant Pressure Pump with pressure transducer, RS-232, and Micro USB control; Stainless Steel; non-flushing pump heads; 110/220 Volt
- ➔ 20 mL packing reservoir assembly with inlet & outlet caps attached
- ➔ 4.6 mm pre-column assembly with packing adapter for 4.6 mm columns
- ➔ Two (2) 4.6 mm x 150 mm columns
- ➔ 10 g bottle of C18 stationary phase
- ➔ Bracket assembly to mount Packing Reservoir to the pump
- ➔ Quick-Set Disk to allow full control of the packing process through a computer
- ➔ Step by step instructions explaining how to set up and pack columns
- ➔ Set of tubing to connect the system for use
- ➔ Set of cables to connect the pump to a computer
- ➔ All necessary fittings and ferrules for tubing connections



REPLACEMENT PARTS	XUHP HEAD	UHP HEAD	L HEAD	M HEAD	H HEAD	XH HEAD
	P-CPU05S	P-CPU12S	P-CP12S	P-CP24S	P-CP100S	P-CP300S
■ Piston Seal Kit*, Aqueous	P-1895	P-1895	P-1595	P-1095	P-1096	P-1795
■ Piston Seal Kit*, Organic	P-1899	P-1899	P-1596	P-1099	P-3009	—
■ Check Valve Kit, Inlet & Outlet	P-1881	P-1985	P-1085-2	P-1085	P-1085	P-1781
Repl Check Valve Capsules, 10/pk	—	P-1875	P-1075	P-1075	P-1075	P-1785
■ Self-Flush Check Valve Kit	P-1084	P-1084	P-1084	P-1084	P-1084	P-1084
■ Replacement Piston	P-1897	P-1597	P-1597	P-1097	P-1198	P-1798
Inlet Filter Assy (Fitting & Element)	06-0110	06-0110	06-0110	06-0110	06-0110	—
Repl Inlet Filter Elements, 2/pk	P-1170	P-1170	P-1170	P-1170	P-1170	—
Repl Outlet Filter Elements, 2/pk	P-1175 (ea)	P-1175 (ea)	P-1175 (ea)	P-1175	P-1172	P-1172

*Seal Kits include: Self-flush seal, O-Ring, Primary Seal, and Removal Tool

TECH TIP

Dual Piston Pump Maintenance

In order to do maintenance on a dual piston pump, kits are sold per head, quantity two required.

High Performance Binary Gradient Pump | LST Class

- ➔ Pulse dampener
- ➔ Self-flushing pump heads and prime purge valve
- ➔ Stainless steel or PEEK fluid path
- ➔ Simple front panel keypad controls with LED display
- ➔ Real-time pressure monitoring with upper and lower pressure limits
- ➔ Drip tray and leak sensor
- ➔ Low volume mixing chamber
- ➔ 3 year warranty



Pump shown with degasser option

Replaces B2300



The customizable Binary Gradient Pumping System is an advanced pumping system for two-solvent high-pressure gradient applications. The system is designed with two single-head positive displacement piston pumps integrated into a functional enclosure. Equipped with belt drive pump mechanisms with shaped cam and electronic fast refill, the system produces very low pulsation.

The included Gradient Board allows for autonomous binary gradient formation without the need for continuous computer monitoring and control. Serial commands may be used to directly set pump flow rates, start/pause, or monitor status. Additional features include control of two solvent-selection valves, multiple timed events, and leak detection.

SPECIFICATIONS

Flow Accuracy	Within 2% of set flow rate*
Pulsation	≤ 2% at 1 mL/min and 1,000 PSI
Pressure Accuracy	± 2% of full scale pressure
Flow Precision	0.2% RSD
Wetted Materials	Synthetic Ruby, Sapphire, UHMWPE, PTFE, PFA
Dimensions (h x w x d)	9" x 10" x 17" (22.9 x 25.4 x 43.2 cm)
Weight	30 lbs (14 kg)
Power	100-240 VAC (± 10%), 50-60 Hz
Control	RS-232, Micro USB, Voltage Flow Control, Run/Stop Gradient Method Development

*Flow rate range for flow accuracy specification:
5 mL—0.20 mL/min and above; 80:20 Water/IPA at 1,000 PSI
10 mL and 40 mL—0.80 mL/min and above; 80:20 Water/IPA at 1,000 PSI

ORDERING INFORMATION

PART NO w/o degasser	PART NO w/degasser	FLOW RATE (mL/min)	MATERIAL	PRESSURE (PSI)	PUMP HEAD
PB-LST05S	PBD-LST05S	5.000	SS	6,000	L
PB-LST05B	PBD-LST05B	5.000	PEEK	6,000	L
PB-LST10S	PBD-LST10S	10.00	SS	6,000	M
PB-LST10B	PBD-LST10B	10.00	PEEK	6,000	M
PB-LST40S	PBD-LST40S	40.0	SS	1,600	H
PB-LST40B	PBD-LST40B	40.0	PEEK	1,600	H

Flow Rate is dependent on solvent selection and operating pressure



Clarity Software Compatible
See page 320

REPLACEMENT PARTS

	L HEAD		M HEAD		H HEAD	
	PBD-LST05S PB-LST05S	PBD-LST05B PB-LST05B	PBD-LST10S PB-LST10S	PBD-LST10B PB-LST10B	PBD-LST40S PB-LST40S	PBD-LST40B PB-LST40B
Piston Seal Kit*, Aqueous	P-1595	P-1595B NEW!	P-1095	P-1095B NEW!	P-1096	P-1096B NEW!
Piston Seal Kit*, Organic	P-1599	—	P-1099	P-1099B NEW!	P-3009	—
Check Valve Kit, Inlet & Outlet	P-1085-2	P-1085-2	P-1085	P-1086	P-1085	P-1086
Repl Check Valve Capsules, 10/pk	P-1075	P-1076	P-1075	P-1076	P-1075	P-1076
Self-Flush Check Valve Kit	P-1084	P-1084	P-1084	P-1084	P-1084	P-1084
Replacement Piston	P-1597	P-1597	P-1097	P-1097	P-1198	P-1198
Inlet Filter Assy (Fitting & Element)	06-0110	06-0110	06-0110	06-0110	06-0110	06-0110
Repl Inlet Filter Elements, 2/pk	P-1170	P-1170	P-1170	P-1170	P-1170	P-1170
Repl Outlet Filter Elements, 2/pk	P-1175	P-1171 (ea)	P-1175	P-1171 (ea)	P-1175	P-1171 (ea)
Pulse Dampener Rebuild Kit	P-1063	P-1063	P-1063	P-1063	P-1063	P-1063

*Seal Kits include: Self-flush seal, O-Ring, Primary Seal, and Removal Tool



Biocompatible Seals

Now offering biocompatible seals which contain a fluoropolymer energizer (vs the Stainless Steel Energizer)

High Flow Dual Piston Pumps | HF 300

- Up to 300 mL/min and 8,500 PSI
- Dual piston design for precise flow rates and low pulsation
- 3 year warranty
- Ceramic pistons and ruby/sapphire check valves



HF 300 PUMP

PART NO	MODEL	FLOW RATE	MAX PRESSURE*	SELF FLUSH
P-5300CFNF	Constant flow	0.1 – 300 mL/min	10,000 PSI	
P-5300CFSF	Constant flow	0.1 – 300 mL/min	10,000 PSI	●
P-5300CPNF	Constant pressure	0.1 – 300 mL/min	10,000 PSI	
P-5300CPSF	Constant pressure	0.1 – 300 mL/min	10,000 PSI	●

*At 220 V, entire power range available. At 110 V, maximum pressure decreases above 250 mL/min.

REPLACEMENT PARTS

Piston Seal Kit*, Aqueous	P-1795
Check Valve Capsules, 4/pk	P-1785
Self-Flush Check Valve Kit	P-1087
Replacement Piston	P-1697
Repl Outlet Filter Element, ea	P-1172

*Seal Kits include: Self-flush seal, O-Ring, Primary Seal, and Removal Tool

HF-300 SPECIFICATIONS

Flow Accuracy	< 5% of set point (above 5 mL/min, 1,000 PSI)
Flow Precision	0.5% RSD
Pulsation	< ± 5.0% from 150 mL/min, 3,000 PSI
Dimensions (w x h x d)	9" x 14" x 22" (22.8 x 35.8 x 55.9 cm)
Weight	50 lbs (22.7 kg)
Input	RS-232

Super Critical Fluid Pumps | SFC-24

- Self-flushing pump head
- 3 year warranty
- Outlet filter
- All aluminum pump heads (for heat transfer)
- Stainless Steel fluid path (other than pump heads)
- Integrated cooling system using Peltier thermoelectric modules
- In-line electronic pressure transducer

The SFC-24 features integrated cooling systems using Peltier thermoelectric modules. The cooling is fully self-contained within the pump cabinet, eliminating the need for external refrigeration units and the associated piping, coolants, and Freon. Peltier technology is 100% solid state.



SFC-24 PUMP

PART NO	MODEL	FLOW RATE	MAX PRESSURE
P-2024SFC	Constant pressure	0.01 – 24 mL/min	10,000 PSI
P-2024SFC-CF	Constant flow	0.01 – 24 mL/min	10,000 PSI

REPLACEMENT PARTS

Piston Seal Kit*, Aqueous	P-2495
Check Valve Kit, Inlet & Outlet	P-2485
Repl Bulkhead Filter Assembly, ea (Inlet or Outlet)	050190
Repl Filter Element for Bulkhead Filter, 2/pk	P-1172
Replacement Piston	P-1097

*Seal Kits include: Self-flush seal, O-Ring, Primary Seal, and Removal Tool

SPECIFICATIONS

Flow Accuracy	± 5%
Pressure Accuracy	± 2% of full scale pressure
Constant Pressure	Pressure monitoring (via transducer) with user-selected upper/lower pressure limits
Control Mode	User-selectable pressure point set. Pump flow rate auto-adjusts to maintain pressure
Dimensions (h x w x d)	5.8" x 11.1" x 22.1" (14.6 x 28.3 x 53.7 cm)
Weight	36 lbs (16.3 kg)
Input	RS-232

Chrom Tech Flash Pumps

A versatile series of pumps designed specifically for Flash Chromatography Applications



SPECIFICATIONS

	ISOCRATIC M1 FLASH	BINARY M1 FLASH	ISOCRATIC LD CLASS
	<ul style="list-style-type: none"> → Simple keypad controls, LED display → Single piston → Electronic rapid refill mechanism → Motor stall detector → 3 year warranty 		<ul style="list-style-type: none"> → Prime/purge valve → Real-time pressure monitoring with upper and lower pressure limits → Drip tray and leak sensor → Pulse dampener → Self-flushing pump heads → 3 year warranty
Flow Accuracy	Within 5% of set flow rate, 2 mL/min and above; 80:20 Water/IPA @ 100 PSI		Within 2% of set flow rate, 2.0 mL/min and above; 80:20 Water/IPA at 1,00 PSI
Flow Precision	1.0% RSD		0.5% RSD
Wetted Materials	Synthetic Ruby, Sapphire, UHMWPE, PTFE, SS		Synthetic Ruby, Sapphire, UHMWPE, PTFE, Ceramic, (SS or PEEK)
Dimensions (h x w x d)	5.5" x 3" x 10.5" (14 x 8 x 27 cm)		6.5" x 10" x 17" (16 x 25 x 43 cm)
Weight	3.5 lbs (1.6 kg)		30 lbs (14 kg)
Power	100-240 VAC (± 10%), 50-60 Hz		100-240 VAC (± 10%), 50-60 Hz
Control	Micro USB Port with RS-232 communication, Run/Stop		Micro USB Port with RS-232 communication, Voltage Flow Control, Run/Stop

CHROM TECH FLASH PUMPS

PART NO	MODEL	MAX FLOWRATE	PUMP HEAD MATERIAL	MAX PRESSURE	PUMP OUTLET CONNECTION
P-M1FS-8	M1 Flash	100.0 mL/min	SS	250 PSI	For 1/8" OD tubing, 3/8-24 coned thread
PB-M1FS-8	Binary M1 Flash	100.0 mL/min	SS	250 PSI	For 1/8" OD tubing, 3/8-24 coned thread
P-LD100S-8	LD Class	100.0 mL/min	SS	1,000 PSI	For 1/8" OD tubing, 3/8-24 coned thread
P-LD100B-8	LD Class	100.0 mL/min	PEEK	1,000 PSI	For 1/8" OD tubing, 3/8-24 coned thread

REPLACEMENT PARTS

	P-M1FS/PB-M1FS	P-LD100S	P-LD100B
Piston Seal Kit*, Aqueous	P-1199	P-1096	P-1096B
Piston Seal Kit*, Organic	880270	P-3009	—
Check Valve Kit, Inlet & Outlet	880417	P-1085	P-1086
Self-Flush Check Valve Kit	—	P-1084	P-1084
Sapphire Piston	880357	P-1198	P-1198
Inlet Filter Assy (Fitting & Element)	06-0110	06-0110	06-0110
Repl Inlet Filter Element, 2/pk	P-1170	P-1170	P-1170
Repl Outlet Filter Element, ea	—	P-1172	P-1171 (ea)
Replacement outlet nut for 1/8" OD tubing, 10/pk	01-0141	01-0141	06-0175
Replacement outlet ferrule for 1/8" OD tubing, 10/pk	01-0143	01-0143	06-0182

*Seal Kits include: Self-flush seal, O-Ring, Primary Seal, and Removal Tool

Chrom Tech/SSI Pump Replacement Parts

MAX PUMP FLOW RATES	5 – 6 mL/min	10 – 12 mL/min	10 mL/min	30 – 50 mL/min	40 mL/min
FOR LEGACY PUMPS:	P-1500, Q-Grad, Essence, P-2005, P-2500	P-1010(B), P-2010(B), P-1524CP, P-2024(B), Series 2, Series 3, Constant Pressure, Flash 2000	P-010(S), Series 1	P-1040(B), P-2040(B), P-2100 (B), P-1100, Series 2, 3, Flash 2000, Prep 100	P-040(S), Series 1
PUMP HEAD MODEL	L HEAD	M HEAD	MM HEAD	H HEAD	MH HEAD
FOR NEXT GENERATION PUMPS:	PBD-LST05(S/B), PB-LST05(S/B), P-LL05(S/B), P-LST05(S/B), P-LS05(S/B), P-CP12S	PBD-LST10(S/B), PB-LST10(S/B), P-LL10(S/B), P-LST10(S/B), P-LS10(S/B), P-LD12(S/B), P-LD36(S/B), P-CP24S	P-ML10(S/B), P-MX10(S/B), P-MXT10(S/B), P-MXT10B-MS, P-M110(S/B)	PBD-LST40(S/B), PB-LST40(S/B), P-LL40(S/B), P-LST40(S/B), P-LS40(S/B), P-LD100(S/B), P-PR100(S/B), P-CP100S, P-0100F(B)	P-ML40(S/B), P-MX40(S/B), P-MXT40-(S/B), P-M140(S/B)
Piston assembly, ea	P-1597	P-1097	P-0101	P-1198	P-1298
Standard piston seal kit, ea	P-1595	P-1095	P-0103	P-1096	P-1295
Standard piston seals, 10/pk	P-1591	P-1090	—	P-3003	—
● Biocompatible piston seal kit*, ea	P-1595B	P-1095B	P-0103B	P-1096B	P-1295B
Piston seal kit, Organic, ea	P-1599	P-1099	P-0109	P-3009	P-1299
● Biocompatible Piston Seal Kit, Organic, ea	—	P-1099B	P-0109B	—	—
Check valve SS (inlet & outlet)	P-1085-2	P-1085	P-1085-2	P-1085	P-1085-2
Check valve PEEK kit (inlet & outlet)	P-1086	P-1086	P-1086	P-1086	P-1086
Replacement capsules, SS (10/pk)	P-1075	P-1075	P-1075	P-1075	P-1075
Replacement capsules, PEEK (10/pk)	P-1076	P-1076	P-1076	P-1076	P-1076
Self flush check valve kit	P-1084	P-1084	—	P-1084	—
Self flush assembly, SS	—	—	P-1082	—	P-1081
Self flush assembly PEEK	—	—	P-1088	—	P-1089
Inlet filter assy (fitting & element)	06-0110	06-0110	06-0110	06-0110	06-0110
Inlet filter element, 20 µm (2/pk)	P-1170	P-1170	P-1170	P-1170	P-1170
Outlet filter element, SS (2/pk)	P-1175	P-1175	P-1175	P-1172	P-1172
Outlet filter elements for PEEK Pumps, ea	P-1171	P-1171	P-1171	P-1171	P-1171
Prime purge valve rebuild kit, SS	P-1177	P-1177	P-1177	P-1177	P-1177
Prime purge valve rebuild kit, PEEK	P-1178	P-1178	P-1178	P-1178	P-1178
Prime purge valve assy, SS, ea	22-0292	22-0292	22-0292	22-0292	22-0292
Prime purge valve assy, PEEK, ea	06-0115	06-0115	06-0115	06-0115	06-0115
Pulse dampener w/transducer, SS—for models with real time pressure monitoring	P-1061	P-1061	P-1061	P-1061	P-1061
Pulse dampener w/transducer, PEEK—for models with real time pressure monitoring	P-1062	P-1062	P-1062	P-1062	P-1062
Pulse dampener (no transducer), SS	—	P-1065	P-1065	P-1065	—
Pulse dampener (no transducer), PEEK	—	P-1066	P-1066	P-1066	—
Pulse dampener rebuild kit	P-1063	P-1063	P-1063	P-1063	P-1063

*Seal kits include: Self flush seal, O-ring, primary seal, removal tool

TECH TIP | Seal Options

Standard Seals—Ultra High Molecular Weight Polyethylene

Organic seals—Graphite-filled PTFE for use with harsh chemicals

NEW! **Biocompatible Seal Option**
Now offering biocompatible seals which contain a fluoropolymer energizer (vs the Stainless Steel Energizer)

Other Chrom Tech Pump Supplies

MISCELLANEOUS SUPPLIES FOR CHROM TECH PUMPS

PART NO	DESCRIPTION	
REPLACEMENT LOW PRESSURE INLET TUBING		
T-10201	1/8" OD FEP Fluoropolymer tubing, 1/16" ID, 10' length	
REPLACEMENT LOW PRESSURE INLET FITTINGS FOR 1/8" OD TUBING		
XP-301	1/4-28 Flat-Bottom Delrin Nut & ETFE Ferrule (P-300), ea	
HIGH PRESSURE OUTLET FITTINGS		
	FOR TUBING OD	
U-400	10-32, SS Nut, ea	1/16"
U-401X	SS Ferrule, 10/pk	1/16"
6000-054	10-32, PEEK Nut, ea	1/16"
6000-051	PEEK Ferrule, 10/pk	1/16"
25-0155	SS Bulkhead, 2 µm outlet filter, ea	1/8"
051018	Filter Closure, ea	1/8"
01-0141	SS Gland Nut, 10/pk	1/8"
01-0143	SS Ferrule, 10/pk	1/8"
REPLACEMENT HIGH PRESSURE OUTLET TUBING		
1531	1/16" OD PEEK tubing, 0.010" ID, 5' length	
U-106	1/16" OD SS tubing, 0.010" ID, 5' length	

6000-054

U-400/U-401



TECH TIP

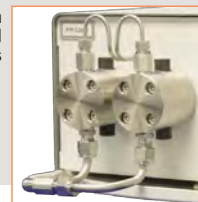
The recommended minimum back pressure is 50 PSI for optimum check valve performance. For pumps with a pulse dampener, we recommend a minimum of 500 PSI back pressure. If your application will not provide adequate back pressure, adding tubing for restriction to the outlet of the pump is recommended.

Contact Chrom Tech Support Desk for quotes and recommendations—support@chromtech.com

TECH TIP | CUSTOM PUMP OPTIONS:

CHROM TECH PUMP	TYPICAL (MOST MODELS)	CUSTOM OPTIONS
Pump outlet	1/16" OD Outlet	1/8" OD outlet
Pump inlet	1/8" OD Low Pressure	1/8" OD High pressure
Material of Pump Head/Tubing	SS or PEEK	Hastelloy C, Titanium
Other		Jacketed heads

Custom jacketed heads



Model LP-21 LO-Pulse

The Model LP-21 LO-Pulse™ pulse damper is a patented wide dynamic range pulse damper designed for use with single piston reciprocating HPLC pumps. It uses 1/4-28 SSI-type fittings and operates up to 6,000 PSI.

The LO-Pulse™ pulse damper reduces pulsations by compressing a fluid held within the bottom cavity of the unit. This fluid is isolated from the LC mobile phase by a durable but flexible inert diaphragm. As the HPLC system pressure increases, fluid in the bottom chamber is compressed. When the LC pump piston is retracting, the compressed fluid expands maintaining system pressure and, more importantly, keeps the mobile phase flowing at a constant rate. When the system pressure is at its maximum allowable pressure (6,000 PSI), the volume of mobile phase in the LO-Pulse is only 0.9 mL.

MODEL LP-21 LO-PULSE

PART NO	DESCRIPTION
20-0218	Model LP-21 LO-Pulse
20-0220	PEEK Model LP-21 LO-Pulse
12-0527	Low cost LO-Pulse (without case)
12-0537	Low cost PEEK LO-Pulse (without case)
P-1063	Spare parts kit (includes diaphragm, o-rings, tools)



The noise level in the detector resulting from pump pulsations can significantly affect precision in qualification and the detection limit of trace components. The LO-Pulse™ pulse damper smooths pump pulsations and maintains constant flow in flow sensitive detectors.

TECH TIP

Ideal to have at least 500 PSI minimum back pressure for optimum efficiency.

L-3320 Autosampler

- ➔ High precision injector provides excellent accuracy and sampling linearity
- ➔ Proprietary needle design significantly reduces sample residue contamination
- ➔ μL pick-up mode achieves zero sample loss

The L-3320 is a low cost, high-performance HPLC autosampler with features such as high sampling precision, low cross-contamination, high durability and easy maintenance.



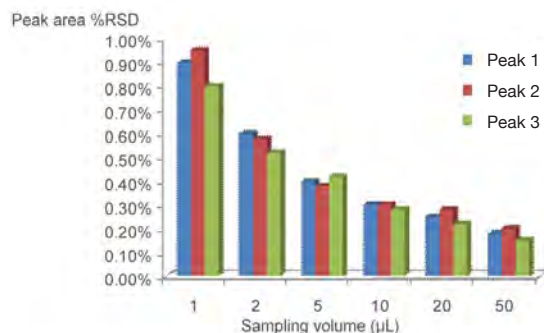
SPECIFICATIONS

Sample Volume:	Standard: 2*48 1.5 mL vials; Optional: 96-hole panel, 384-hole panel
Volume of Sample Loop:	Standard: 50 μL ; Optional: 10, 20, 100 μL
Injection Pump:	Standard: 250 μL ; Optional: 100 μL
Sampling Mode:	Full loop, partial loopfill and μL pick-up
Repeatability:	Full loop: RSD \leq 0.3%; Partial loop: RSD \leq 0.5%; μL pick-up: RSD \leq 1.0%
Cross Contamination:	< 0.05%
Max Sampling Volume:	Full loop = loop volume; Partial loop = 1/2 loop volume; μL pick-up = (loop vol. - 3 \times needle vol.)/2
Linearity:	> 0.999
Max Pressure:	6,000 PSI
Sample Tray:	2 – 48 position trays for 2 mL vials (12 x 32 mm) Optional 96 well plate tray
User Interface:	Clarity Software (sold separately) vis RS-232
Weight:	12.6 Kg
Dimensions: (d x w x h)	17.8" x 14.1" x 9.6"
Power Supply:	100 VAC – 240 VAC, 50/60 Hz, 110W max

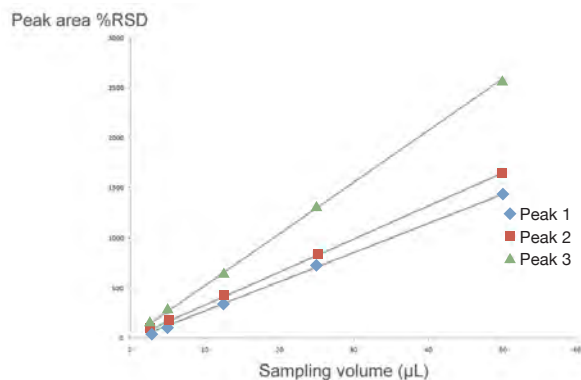


Clarity Software Compatible
See page 318

L-3320 provides excellent accuracy and linearity of sample injection.



L-3320 provides excellent sampling linearity.



L-3320 AUTOSAMPLER

PART NO	DESCRIPTION
LC-L3320	L-3320 Autosampler
REPLACEMENT PARTS	
1020001533	Auto Injection Valve
1020001545	Syringe, 30 mm, 250 μL , long screw
1020001546	Distribution Valve, PCTFE
2010001462	Sample Needle
1020000170	Sample Rack - 48-position

Vacuum Degasser

- ➔ Ultra-high efficiency degassing
- ➔ Continuous monitoring for leaks and errors
- ➔ Quiet, long-life operation
- ➔ Designed for HPLC — No solvent compatibility issues

The Systec HPLC vacuum degassing systems are high-efficiency, in-line modules that remove dissolved gases from the mobile phase. Their unique design assures reliable continuous operation and the highest level of performance available.

Flow-through vacuum degassing chamber with a single amorphous perfluorinated copolymer (Systec AF[®]) degassing membrane, enabling degassing efficiency 50 times that of PTFE.

The ZHCR (Zero Hysteresis / Constant Run) vacuum pump employs a patented closed-loop, micro-stepping rpm control strategy permitting the pump to run with continuously variable speed, providing quick pull-down at high rpm, and then sustaining a consistent vacuum level at low rpm.

Fluctuations in detector baseline due to changes in vacuum level are eliminated by not having to repeatedly stop and start a single-speed pump. This also greatly reduces wear and noise.

The brushless motor enables quiet operation and is appropriate for environments where solvent vapors may be present.



TECH TIP

Tubing Connections

ETFE tubing is an ideal choice for the fluid pathway between the vacuum degasser and the system's pump. Its low gas permeability will help ensure the mobile phase solvents do not re-gas while in transit.

VACUUM DEGASSER SPECIFICATIONS

Volume/Channel:	480 μ L	Flow Rate/Channel:	1.0 mL/min (for 70% gas removed from MeOH) ¹
Pressure Drop²:	1.37 mm Hg/mL/min	Flow Path ID:	0.45" (1.14 mm)
Wetted Pathways:	Metal-free, PEEK and PTFE	Connections:	1/4-28 flat-bottom ports ³
Signal:	5 mVDC/1 mm Hg absolute from 20 – 800 mm Hg (0.100VDC at 20 mm Hg; 4,000 VDC at 800 mm Hg)	Accuracy:	\pm 1.0% of reading \pm 0.010VDC from 20 – 800 mm Hg
Display:	LED indicator lights	Dimensions:	2.87" W x 5.00" H x 9.81" D
Power Requirement:	100 to 240 VAC (\pm 10%), 1A, 50 to 60 Hz (\pm 3 Hz), AC adapter included. Four interchangeable plugs are supplied with the AC adapter: North America/Japan, U.K., Continental Europe and Australia	CE Certification:	These products have been certified under the following CE testing standards: EN61326-1; EN55011; EN61300-3-2; EN61300-3-3 and ENG61010-1
Patents:	Degasser technology protected by U.S. Patents 5,340,384; 6,248,157 and 6,494,938		

1) Flow rate that will remove 70% of dissolved gas from a single channel of pure methanol.

2) Estimated tubing pressure per unit change in flow assuming laminar flow with a viscosity of 1.0 cp

3) Fittings are not included with the unit. Accepts 1/4-28 flangeless fittings.

VACUUM DEGASSER ORDERING INFORMATION

PART NO	DESCRIPTION
VD-2101	2 Channel Model
VD-4101	4 Channel Model
RECOMMENDED FITTINGS AND TUBING (NOT INCLUDED WITH UNIT):	
XP-201	Flangeless Fitting Delrin [®] , Black 1/4-28 Flat-Bottom, for 1/16" OD
XP-301	Flangeless Fitting Delrin [®] , Black 1/4-28 Flat-Bottom, for 1/8" OD
1516XL	EFTE Natural Tubing, 0.020" ID, 1/16" OD, 100' length
1528XL	EFTE Natural Tubing, 0.030" ID, 1/16" OD, 100' length
1530	EFTE Natural Tubing, 0.062" ID, 1/8" OD, 5' length
1530XL	EFTE Natural Tubing, 0.062" ID, 1/8" OD, 100' length



H-705 Column Oven

- ➔ Updated electronics with higher performance and increased accuracy
- ➔ Front keypad control with 5-digit, blue LED display
- ➔ Compact footprint requires less bench space
- ➔ Large capacity with no need for special blocks or inserts
- ➔ Temperature is maintained over entire length of fluid path
- ➔ Universal power supply
- ➔ Self-resetting thermal safety cutoff at 118° C
- ➔ Anodized, solvent-resistant aluminum column chamber

Temperature changes throughout the day, and even drafts in your laboratory can adversely affect results. The H-705 column oven accurately maintains temperature within $\pm 0.2^\circ\text{C}$ to provide precise control and repeatable results that increase the accuracy and consistency of your chromatography.

All critical elements—columns, injector, and precolumns—are enclosed in the oven chamber. Constant temperature is maintained over the entire length of the fluid path.

Mobile phase is used as the transfer medium so temperature is unaffected by flow rate. The mobile phase passes through an innovative preheater plate within the oven chamber before connecting to the column. The tubing mounted within this plate is 0.010" ID x 50 cm long. Maximum delay volume is 25 μL , though the tubing is crimped in a saw-tooth configuration to minimize volume and optimize heat transfer, as a result, delay volume is only 7.5 μL .

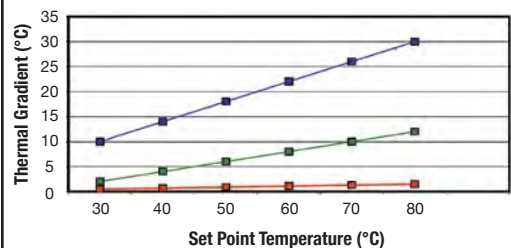


Clarity Software Compatible
See page 318

SPECIFICATIONS

Temp Range:	10° above ambient to 100 °C
Recomm. Flow Range:	Up to 8 mL/min
Temp Set Increments:	0.1 °C increments
Temp Accuracy:	$\pm 2^\circ\text{C}$ over entire range. The setpoint changes slightly depending on composition and mobile phase flow rate
Temp Repeatability:	$\pm 1^\circ\text{C}$
Temp Stability:	$\pm 0.2^\circ\text{C}$
Thermal Safety cutoff:	118 °C, self-resetting
Stabilizing Time:	30 min to 100 °C for "ready" at 2 mL/min. For analyses requiring high precision, wait 30 min after the READY light illuminates before beginning an analysis
Avg Cooling Time:	30 min to 10 °C above ambient at 2 mL/min from 100 °C (with cover off)
Column Capacity:	Up to six (6) analytical or GPC columns, Up to three (3) 3/8" x 30 cm columns, or four (4) 1/4" x 30 cm columns
Chamber Material:	Anodized, solvent resistant aluminum
Power Requirement:	100-240 VAC (+/- 10%), 50/60 Hz, 120 W
Dimensions: (h x w x d)	External: 6.4" H x 5.1" W x 19.6" D (16.3 x 13 x 50 cm) Internal: 1.6" H x 2.7" W x 16.2" D (4.1 x 6.9 x 41 cm)
Weight:	15 lbs (6.8 kg)
Control	Front keyboard control, blue LED, 5-digit display

Thermal Gradient vs. Set Point Temperature (Based on 25 cm column)



— H-705 Column Heater with innovative solvent preheater — Standard Preheater Block — Conventional Oven without preheater

The thermal gradient being measured is solvent temperature entering the column versus that exiting the column. Better separation can be expected if this temperature differential is minimized.

NEXT GENERATION COLUMN OVEN ORDERING INFORMATION

CATALOG NO	DESCRIPTION
H-705	Next Generation Column Oven with updated electronics for higher performance and increased accuracy
<i>H-705 replaces legacy H-605 column heater.</i>	

H-105 Column Heater

- Heats multiple columns
- Preheats the mobile phase
- Injection or switching valves in the heated compartment
- Temperature stability

The H-105's microprocessor controlled heating provides stable and accurate temperature control, reproducible retention times, and stable baselines for temperature sensitive detectors. Increasing column temperatures reduces peak tailing due to surface silanol interactions, improves efficiency, reduces backpressure and prevents column contamination.

The column, preheater, and installed valves in the heated cavity are easily accessed through an insulated cover held in place on the top of the unit with thumbscrews. Inadvertent solvent leaks are easily detected and directed away from heater electronics by a drain tube in the heated compartment connected to a bulk head fitting on the back of unit.



An optional injection or switching valve can be mounted in the heated compartment. Heating the valve provides sample and mobile phase preheating. Multiple columns can be stored in the H-105 and conveniently selected with a switching valve.

H-105 COLUMN HEATER	
PART NO	DESCRIPTION
H-105	Column heater, 120 V
H-105-50	Column heater, to fit 50 cm columns, 120 V
H-105-HT	Column heater, high temp, up to 150 ° C, 120 V
H-105-SPEC	Column heater custom configured
COLUMN HEATER ACCESSORIES	
HX-101	Spare heat exchanger
7725I	Sample injector with switch built-in

SPECIFICATIONS	
Temp range:	5 ° above ambient to 100 °C 5 ° above ambient to 150 °C (H-105-HT)
Temp stability:	±0.1 °C (H-105, H-105-50)
Operating voltage:	120 VAC or 240 VAC
Case:	20 x 57 x 13 cm (H-105)
(w x l x h)	20 x 65 x 13 cm (H-105-50) 20 x 76 x 13 cm (H-105-70)
Heated cavity :	9 x 44 x 7 cm (H-105)
(w x l x h)	9 x 58 x 7 cm (H-105-50) 8.3 x 71 x 6.5 cm (H-105-70)

MonoSLEEVE™ & MultiSLEEVE™ Controllers & Heaters

- Temperature Range: 5 °C above ambient to 85 °C
- Tube style design: Unsnap for easy column insertion & removal
- Plug & Play smart heater technology, self calibrating

MonoSLEEVE™ is the next generation of the original HotSLEEVE controller. With it's new advanced "Plug-and-Play" technology, MonoSLEEVE can accommodate single HotSleeve Plus column sleeves of different sizes without having to recalibrate to each individual sleeve.

The MultiSLEEVE controller is used for applications which require multiple heating zones or multiple LC system heating. Used in conjunction with the HotSleeve Plus heaters, it maintains four independent channels simultaneously and accurately while reducing overall equipment costs.

HOT SLEEVE & CONTROLLER	
PART NO	DESCRIPTION
H-2001C	MonoSleeve single column heater controller, includes: MonoSLEEVE Controller, Power Supply, USB Cable, GUI, and Manual. <i>Hot Sleeve+ sold separately</i>
H-2004C	MultiSleeve 4 column heater controller, includes: MultiSLEEVE Controller, Power Supply, USB Cable, GUI, and Manual. <i>Hot Sleeve+ sold separately.</i>
H-2005CS	5 cm Hot Sleeve+, <i>requires MonoSLEEVE controller — sold separately</i>
H-2010CS	10 cm Hot Sleeve+, <i>requires MonoSLEEVE controller — sold separately</i>
H-2015CS	15 cm Hot Sleeve+, <i>requires MonoSLEEVE controller — sold separately</i>
H-2025CS	25 cm Hot Sleeve Plus, <i>requires MonoSLEEVE controller — sold separately</i>
H-2030CS	30 cm Hot Sleeve Plus, <i>requires MonoSLEEVE controller — sold separately</i>
HX-038-EXP	3.8 µL Preheater, 1/16" OD x .005" ID x 30 cm, designed to work with EXP fitting



HX-038-EXP
(sold separately)

TECH TIP

When heating your column above 40 °C, it's important to preheat your mobile phase so a temperature gradient does not occur along the column.

Add 10 cm to your column length when ordering your Hot Sleeve and the HX-038-EXP preheater will fit inside the heated column jacket.



EXP Ferrule-15-24-03832

EXP Nut—15-20-03930
Hand-tight to 8,700 PSI
Wrench-tight to 20,000 PSI

Fixed Wavelength Detectors

SPECIFICATIONS

ECOM FIXED WAVELENGTH



ECOM APPATITE FIXED WAVELENGTH



- Built in lamp with working hours counter
- Easy replacement of flow cell
- Sophisticated diagnostic software

Fixed Wavelength:	200 – 600 nm (256 elements on CCD) (Fixed wavelength set in production)	200 – 600 nm (optional up to 800 nm) (Fixed wavelength set in production)
Bandwidth:	According to filter used	
Light Source:	Deuterium discharge lamp	
Linearity:	Better than 2%	
Typ. Spectral Half-Width:	8 nm	
Accuracy of Adj. λ:	± 1 nm	
Noise:	± 5·10 ⁻⁵ AU (254 nm, TC 0.75 s) (with Test Cell)	± 5·10 ⁻⁶ AU (with empty cell 254 nm)
Drift at Test Cell:	1 x 10 ³ AU/hr (254 nm after 1 h)	
Materials:	PTFE; fused silica; stainless steel	PTFE, fused silica, stainless steel (depends on flow-cell)
Time Constant:	0.5 s; 0.75 s, 1 s or 2 s (T63 0.3s;0.4s;0.6s;1s)	Ca. 1 s
Digital Output:	1 V/AU	1 V/AU
Interface:	RS-232	
Power Supply:	24 – 36 V DC	100-240 V 50/60 Hz 110VA
Power Input:	48 W	
Dimensions: (w x h x d)	5.2" x 6.6" x 15.2" (131 x 167 x 386 mm)	5.9" x 5.5" x 10.6" (150 x 140 x 270 mm)
Weight:	7 lbs	7.5 lbs

ECOM FIXED WAVELENGTH UV DETECTORS

PART NO	DESCRIPTION
FIX21000	Fixed Wavelength Single UV Detector, specify wavelength at time of order
FIX22000	Fixed Wavelength Dual UV Detector, specify wavelength at time of order

REPLACEMENT PARTS

22590001	Deuterium lamp
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ECOM APPATITE FIXED WAVELENGTH DETECTOR

DE00000X	Apatite UV-VIS Fixed Wavelength Detector
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REPLACEMENT PARTS

254-12-0.5-M	254 nm Interference Filter
7900000X	Analytical Cell HPLC



ECOM FIXED WAVELENGTH

This fixed wavelength UV detector is suited for preparative and flash chromatography applications.

PREPARATIVE CELL PLCC-15* SPECIFICATIONS

Volume/Optical Path: (adjustable) 45 µL/0.3 mm;
55 µL/1.4 mm; 70 µL/2.4 mm

Cell Connecting: tubing with OD = 1/8",
thread 1/4"-28

Maximal Flow Rate: 500 mL/min

*Supplied with unit



ECOM APPATITE FIXED WAVELENGTH

Apatite is a detector with an interference filter. By means of this filter, this unit can be adjusted at one fixed wavelength in range of 200 – 600 nm (optionally up to 800 nm, filter is not included in price). The unit is designed for use in routine analytical chromatography applications.

This unit is easy to operate; reference and sample signals are available for detector diagnostics as well as information on lamp working hours. Output signal is available in digital form on the output connector. The unit is supported in Clarity (CT-C50). The detector is equipped with a high standard deuterium lamp in a special socket that enables easy changing. It is possible to change the interference filter at customer's preferences.



Clarity Software Compatible
See page 318

UV/VIS Variable Wavelength Detectors

SPECIFICATIONS

ECOM UV2600 & UV2800



- **Spectral Half-Width:** 6 nm
- **Reproducibility:** ±0.5 nm
- **Time Constant:** 20 – 10,000 ms
- **Digital Output:** 1 V/AU
- **Analog Output:** 1x configurable
- **Wetted Materials:** Flow cell dependent—fused silica, PTFE, SST, Vespel, PEEK
- **Display, Keypad:** VFD 140 x 32 pixels, 10 push buttons

RIGOL L-3500



- **Spectral Width:** 8 nm
- **Wavelength Precision:** 0.2 nm
- **Linear Range:** >5x10⁻⁴ (JJG) >2.5 AU (ASTM)
- **Flow Cell Pressure:** 10 Mps
- **Flow Cell Light Path:** 10 mm
- **Flow Cell Volume:** 12 µL
- **Detection Limit:** 5 x 10⁻⁹ g/mL

Wavelength Range:	UV 2600: 190 – 600 nm UV 2800: 190 – 800 nm	190 – 800 nm
Wavelength Accuracy:	±1 nm	
Sampling Speed:	up to 100 Hz	
Drift:	1 x 10 ⁻⁴ AU/hr	
Noise:	±3 x 10 ⁻⁶ AU at 254 nm, TC 1s, 10 Hz	±0.5x10 ⁻⁵ AU (JJG) ±0.35x10 ⁻⁵ AU (ASTM)
Light Source:	Deuterium	Deuterium, Tungsten
Interface:	ECOMAC or Clarity Software (sold separately) via RS-232 or Ethernet	Clarity Software (sold separately) via RS-232
Dimensions: (d x w x h)	19.6" x 11" x 5.5"	18.2" x 14.4" x 5.6"
Weight:	20 lb	27.8 lb
Electrical:	100 – 240 V 50/60 Hz 100 VA	100 - 240 V, 50/60 Hz, 90 W max

ECOM VARIABLE WAVELENGTH DETECTORS

PART NO	DESCRIPTION
UV-2600	Var λ Detector, 190 – 600 nm, analytical
UV-2800	Var λ Detector, 190 – 800 nm, analytical
UV-2800CE	Var λ Detector, 190 – 800 nm, CE

REPLACEMENT PARTS

ADA6000X	Analytical flow cell, 2.0 mm path length, AC02
ADA4000X	Test flow cell TC01
ADA33000	Deuterium lamp
2052B900	Tungsten lamp with cable and connector (for ECOM UV 2800 only)

RIGOL VARIABLE WAVELENGTH DETECTORS

L-3500	Var λ Detector, 190 – 800 nm, analytical
L-3500-FC	Analytical flow cell, 10 mm path length

REPLACEMENT PARTS

L-3500-D2	Deuterium lamp
L-3500-W	Tungsten lamp



ECOM UV2600 & UV2800

ECOM'S UV 2600/2800 may be used for analytical applications as well as for preparative/flash chromatography, according to the selected cell. It is easy to operate; light intensities for reference and sample channels are available for detector diagnostics as well as information on lamp operating hours. The detector performs automatic wavelength calibration after the lamp has been switched on. High standard deuterium lamp in a special socket enables easy exchange. Output signal is available in both digital and analog form. Detector could be controlled and used together with Clarity or ECOMAC software via RS-232 or Ethernet interface.

The flow cell can be easily removed from the front of the unit. Flow cell AC05 is included as component of the detector.



RIGOL L-3500

L-3500 is a variable-wavelength UV-Visible light detector, with wavelength range 190-800 nm. Designed & developed by RIGOL's patented technology, and manufactured through advanced processing,

L-3500 owns world-class performance parameters: data rate up to 100 Hz, very low noise & drift level and detection limit. It can be widely used for analysis of compounds with UV absorbance.



Clarity Software Compatible
See page 318

UV/VIS Multiple Wavelength & Diode Array Detectors

SPECIFICATIONS

ECOM FLASH 10



- Absorbance measuring on four wavelengths simultaneously
- Up to 250 mV Analog Offset Programmable
- Easy service and diagnostics using display and keypad

ECOM FLASH 14



- Absorbance measuring on four wavelengths simultaneously
- or –
- Continuous 5 Hz spectral scan
- Clarity PDA module extension supported for 3D measurement

SCHAMBECK 4245



- 10 step programmable wavelength detector with optional dual wavelength and online scan
- Integrated peak detector works as a basic fraction collector—
Program start/end peak detection level with selectable time delay

Wavelength Range:	See ordering information		190 – 900 nm
Scan:	N/A	200 – 800 nm, 5 Hz, step 3 nm	Optional online scan
Typical Spectral Half-width:	F10-400: 8 nm F10-800: 10 nm F14-400: 8 nm F14-800: 10 nm		
Accuracy of Adjustment:	±1 nm		± 2 nm
Linearity:			> 2.0 AU
Reproducibility:	± 0.5 nm		
Light Source:	Deuterium discharge lamp (and Halogen lamp to 840 nm)		Deuterium Lamp, Tungsten Lamp
Noise:	± 5 x 10 ⁻⁵ AU (at 254 nm TC 0.75 s)		± 1 x 10 ⁻⁵ AU (at 240 nm, 1 sec. Rise time)
Drift:	1 x 10 ⁻³ AU/hr (at 254 nm after 1 h)		2 x 10 ⁻⁴ AU/h
Wetted Materials:	PTFE; fused silica; stainless steel		Stainless Steel; PEEK
Time Constant (T90):	0.5 s; 0.75 s; 1 s or 2 s (T63 0.3s; 0.4 s; 0.6 s; 1 s)		
Digital Output for Integrator:	1 V/AU	1 V/AU (in digital form only)	1 V/AU per channel
Analog Outputs:	4 x 1 V: 5; 3; 2; 1; 0.5; 0.25; 0.1; 0.05 AU/V for integrator w/sensitivity switching	N/A	1 x 1 V (single wavelength) 2 x 1 V (dual wavelength)
Interface:	RS-232		
Power Supply:	90-264 V		100 - 250 V (47–63 Hz)
Power Input:	100 VA		
Dimensions:	5.3" x 6.7" x 16.5" (135 x 170 x 418 mm)	11.0" x 5.1" x 18.2" (280 x 130 x 463 mm)	12.2" x 6.5" x 18.8" (310 x 165 x 478 mm)
Weight:	13.2 lb (6.0 kg)	19.8 lb (9.0 kg)	15.4 lb (7.0 kg)

ECOM FLASH 10 & FLASH 14

FLASH 10 MWD	FLASH 14 DAD	DESCRIPTION
F10-400	F14-400	200 – 400 nm, 4 wavelength, prep flow cell
F10-800	F14-800	190 – 840 nm, 4 wavelength, prep flow cell
REPLACEMENT PARTS		
22590005	22590005	Deuterium lamp with chip
2052B900	2052B900	Halogen lamp (400 – 840 nm range)
3210000X	3210000X-B	Preparative flow cell
12L0000X	—	Analytical flow cell*

* ECOM Flash detectors are designed for preparative scale chromatography. Analytical flow cells are available with consideration, please contact Chrom Tech technical support to discuss.

SCHAMBECK 4245

PART NO	DESCRIPTION
4245	UV/VIS Detector S 4245, 1 Channel
4245-2	UV/VIS Detector S 4245, 2 Channels
4245-2S	UV/VIS Detector S 4245, 2 Channels with online scan option stored internally
REPLACEMENT PARTS	
4010001	Tungsten Lamp for S 4245, preadjusted
4010002	Deuterium Lamp for S 4245, preadjusted
1032009	Flow cell, analytical, SS, 7.9 µl, 10.0mm flow path
10320013	Flow cell, semi-preparative, SS, 2.7 µl, 1.5mm flow path



Clarity Software Compatible
See page 318

RI-S2020 Refractive Index Detector

The Refractive Index Detector S 2020 series provides a consistent enhancement of the already successfully established RID models RI2000 and RI2000-F. The RID S 2020 series offers users 3 times higher sensitivity, (compared to RI2000) stability and reproducibility required for optimal RI detection in HPLC / GPC. By consistently revising the electronic components, it has been possible to significantly improve drift and noise

The optical system is now better insulated against temperature changes and with programmable temperature settings, ensures a stable baseline and an optimal signal/noise-ratio. The auto zero, purge, polarity, temperature and the frequency for data output are externally controllable by USB or RS232 Port. RID system status - information such as temperature and total voltage can be externally retrieved by RS232 or USB.

The Refractive Index Detector S 2020 offers communication interface to acquire data directly with Clarity Chromatography Software without using any external signal interface. The Refractive Index Detector S 2020 includes - micro, - analytical and - semi preparative refractive index detectors.



RI-S2020 SPECIFICATIONS			
	S 2020M	S 2020A	S 2020P
Detection Method:	Deflection	Deflection	Deflection
Refractive Index Range:	1.00 – 1.75	1.00 – 1.75	1.00 – 1.75
Flow Rate:	0.2 – 3.0 mL/min	0.2 – 3.0 mL/min	5 – 50 mL/min
Flow Cell Volume:	4 µL	9 µL	13 µL
Flow Cell Pressure:	85 PSI	85 PSI	85 PSI
Dead Volume Into Cell:	6 µL	24 µL	88 µL
Linearity Range:	0 – 500 µRIU	0 – 1,000 µRIU	0 – 20,000 µRIU
Noise Level:	10 x 10 ⁻⁹ RIU	5 x 10 ⁹ RIU	10 x 10 ⁻⁸ RIU
Autozero Range:	Full Range	Full Range	Full Range
Drift with 1 ml H ₂ O/min:	< 1 mV/hour	< 1 mV/hour	< 1 mV/hour
Purge Valve:	Yes	Yes	Yes/No (depends on flow)
Integrator Output:	+/- 1 Volt		
Recorder Output:	+/- 10 mV/ 100 mV/ 1 Volt		
Recorder Offset:	0 mV/ 10 mV/ 100 mV		
Recorder Range	8 steps (1:8) – (16:1)		
Marker:	Yes/No		

RI-S2020 REFRACTIVE INDEX DETECTORS	
PART NO	DESCRIPTION
S-2020M	Refractive Index Detector, Micro
S-2020A	Refractive Index Detector, Analytical
S-2020P	Refractive Index Detector, Semi-Preparative
REPLACEMENT PARTS	
RI2000-030	Micro flow cell
RI2000-001	Analytical flow cell
RI2000-031	Semi-Preparative flow cell
RI2000-012	Replacement lamp
RI2000-024	Seal kit
RI2000-006	Purge valve



Clarity Software Compatible
See page 318

ZAM 4000 Evaporative Light Scattering Detector

The Evaporative Light Scattering Detector ZAM 4000 is an universal detector for HPLC. It is used to analyze components which do not have UV absorption, cannot be separated with an isocratic solvent and must use a gradient elution, which cannot be used with a refractive index detector. Only mobile phases without any buffers should be used.

In contrast to other evaporative light scattering detectors all parts of the ZAM 4000 detectors which come in contact with the sample are made of PTFE or glass. By this parts are inert to common solvents and easy to clean. One more advantage of glass parts is the fact that contamination can be located easily. The nebulization takes place in the glass nebulization chamber. From here the aerosol is guided into the evaporation chamber which is made of glass, too. The solvent evaporated and only small sample particles reach the detection chamber. Here this particles pass a beam of bright light. By this the light is scattered in all directions. The scattered light is detected by a photomultiplier in an angel of 120°. The signal is amplified and exported as the detector signal. All parts which get in contact with the sample can be un-mounted and cleaned easily.



ZAM 4000 SPECIFICATIONS

Detection Method:	Highly sensitive photomultiplier tube
Nebulizer Material Drying:	Glass, easy to clean, resistant to all common solvents
Chamber Material:	Glass, easy to clean, resistant to all common solvents
Nebulizer Chamber:	Glass, easy to clean, resistant to all common solvents
Material Light Source:	White LED
HPLC Mobile Phase Flow Rate:	0.5 – 3.5 mL/min
Additive Gas Controlling:	Fixed gas flow (1.9 L/min.)
Gas Consumption:	~ 3.7 L/min.
Recorder Output:	0 V - +1.2 V
Digital Interface:	RS-232
Digital Input:	AutoZero, Start (Gas on / PMT power) (TTL)
Temperature Settings:	35°C - 85°C, ambient
Data Smoothing:	Raw, Fast, Slow, Medium
Power:	110 V AC / 220 V AC
Dimensions (w x h x d):	18 x 49 x 50 cm
Weight:	24 kg

ZAM 4000 EVAPORATIVE LIGHT SCATTERING DETECTOR

PART NO	DESCRIPTION
ZAM4000	ZAM 4000 (without Mass flow controller)
REPLACEMENT PARTS	
ZAM3000-1	Nebulizer
ZAM3000-2	Nebulizer chamber
ZAM3000-3	drying chamber
ZAM3000-4	Mass flow controller
ZAM3000-5	Main board

ISCO Foxy® R1 & R2 Fraction Collectors

- ➔ Sturdy cast aluminum frame
- ➔ Easy to use symbolic touch screen interface
- ➔ Built-in Ethernet and RS-232 communication capabilities
- ➔ Faster tube changes
- ➔ μL delay volume between diverter valve and drop former
- ➔ Flow rates up to 100mL/minute



ISCO FOXY FRACTION COLLECTOR SPECIFICATIONS

Dimensions: (w x d x h)	Foxy R1: 12.25" x 13.0" x 14.0" Foxy R2: 12.25" x 21.0" x 14.9	Inputs:	Pump counter ¹ , external peak ¹ , inject, tube advance ¹ , analog peak voltage ²
Weight:	Foxy R1: 16.95 lbs Foxy R2: 23.4 lbs (with drip tray, no rack)	Outputs:	Pump pause ³ , tube change ³
Max Flow Rate:	100 mL/minute	Tube Changes:	At detected peaks, plus drop counts, time, or external pump counts.
Delay Volume:	Diverter valve located at drop former. Delay volume compensation only required for length of tubing to the diverter valve.	System Control:	Operator: front-panel control via touchscreen LCD Integrated systems: direct communication with fraction collector via Ethernet (TCP/IP) and RS-232 serial communications.
Peak Detection:	Slope and/or level sense, with or without time window	Operating Voltage:	100/117 VAC 50/60 Hz, 234 VAC 50/60 Hz

- 1) High on +3.3 to 5 V or contact closure, active low, 30 ms min, 5 VDC max.
 2) 0 to 1.0 V nominal, -1.2 to +1.2 V usable, -5 to +5 V max.
 3) Outputs are open collector active low, 30 ms min, 5 VDC max.

ISCO FOXY FRACTION COLLECTOR

PART NO	DESCRIPTION
FC-R1	Foxy R1, Single rack collector (includes one 13 mm rack)
FC-R2	Foxy R2, 2 rack collector, with rack sensing (includes two 13 mm racks)
CONNECTION CABLES FOR FOXY R1 AND R2	
FCC-474	Remote start signal from HP1100/1200 and peak separation
FCC-170	Pump cable connection (any pump)
FCC-171	Detector cable connection (contact closure or TTL I/O)
OPTIONAL RACKS FOR FC-R1 AND FC-R2, EA:	
FCR-155	(144) 12 mm dia. tubes
FCR-150	(144) 13 mm dia. tubes
FCR-154	(60) 1.5 mL microcentrifuge tubes
FCR-151	(100) 16 mm dia. tubes
FCR-152	(72) 18 mm dia. tubes
FCR-158	(72) MiniVials
FCR-156	(36) 28 mm dia. scintillation vials
FCR-153	(36) 25 mm dia. tubes
FCR-157	(36) 50 mL cone-bottom centrifuge tubes, 28 – 29 mm diameter x 150 mm
FCR-159	(2) 96-well microplates
OPTIONAL RACKS FOR FC-R2 ONLY, EA:	
FCR-161	Preparative rack with (26) Halar funnels for large fractions (requires qty 1)
FCR-162	Preparative rack with (26) Halar funnels for large fractions (requires qty 1) Organic compatible

Foxy R1 & R2 Fraction Collectors

These cold room compatible fraction collectors can be adapted to a broad spectrum of applications. The units can distribute fractions into 96 well microplates, standard tube sizes, and bottles. For essentially unlimited volumes, funnel racks can direct fluids to any collection vessel or downstream process. Multiple fraction collectors may be "daisy chained" together to increase your fraction capacity—an exclusive feature from Teledyne ISCO.



Clarity Software Compatible
See page 318



Foxy R2 Fraction Collector

The two-rack Foxy R2 fraction collector uses radio frequency identification to automatically detect collection racks for easy setup.

DataApex Clarity Chromatography Software

- ➔ Easy to install and use
- ➔ Tools for regulated environment
- ➔ Competitive pricing and free software updates
- ➔ Direct control of many vendors chromatography instruments
- ➔ Modules for specific calculations and methodology

Clarity is an advanced Chromatography Data Station (CDS) with optional software modules for data acquisition, data processing, and instrument control. Its wide range of data acquisition interfaces (A/D converters, LAN, USB, RS-232) allows connection to virtually any chromatograph.

Up to four independent chromatography systems can be simultaneously connected.

Clarity can be used with any GC or HPLC. Together with optional control modules and extensions it provides laboratories with a complete chromatography data handling system. The Control modules provide integrated control of selected instruments. Extensions provide functions for specific separation techniques such as PDA or GPC Analysis.

Clarity comes with extensive free support from DataApex as well as from the growing community of users in the Clarity forum. Clarity is now compatible with Windows® 10.



Contact Chrom Tech Support Desk for a quote specific to the instrumentation in your lab—support@chromtech.com



Clarity is the most comprehensive of our stations. Its features include data acquisition from multiple instruments, direct control of GCs, LCs and autosamplers using Controls; access to advanced analyses through Extensions; and support of 21 CFR Part 11.



Clarity Lite is a simplified version of Clarity that provides data acquisition from one chromatograph* (up to four detectors sharing a common time-base). Clarity Lite can be easily upgraded at a later date. *Requires A/D converter



Clarity Offline allows users to evaluate data and prepare methods. This version cannot acquire data but it can share data or even directly access (through LAN) projects of the other two stations. With Clarity Offline users are able to work with acquired data on additional computers.

DATAAPEX CLARITY CHROMATOGRAPHY SOFTWARE		
MODEL	DESCRIPTION	PART NO
STEP 1: CHOOSE YOUR SOLUTION PACKAGE(S)		
Clarity	Extensible, Single Instrument SW, CFR21/GLP ready	CT-C50
Clarity Lite	Simplified, Single Instrument SW*	CT-C40
Clarity Offline	Offline version for data processing	CT-C59
STEP 2: OPTIONAL EXTENSION MODULES (NOT COMPATIBLE WITH CLARITY LITE)		
Clarity Add-on	Single Instrument Add-on	CT-C55
SST	System Suitability Test	CT-A22
GPC	GPC/SEC data processing	CT-A28
PDA	PDA data processing	CT-A29
EA	Elemental Analysis	CT-A30
CE	Capillary Electrophoresis	CT-A31
NGA	Natural Gas Analysis calculation	CT-A32
STEP 3: CHOOSE INSTRUMENT CONTROL OPTION(S)		
AS Control	SW module for autosampler control	CT-A26
GC Control	SW module for GC control	CT-A23
LC Control	SW module for LC control (pump, detector, etc.)	CT-A24
STEP 4: DATA ACQUISITION, A/D CONVERTERS		
Colibrick	External USB, 1 channel	CT-U31
Colibrick	External USB, 2 channels	CT-U32
Colibrick	External USB, 4 channels	CT-U34
STEP 5: USB TO RS232 CONVERTER		
MultiCOM	MultiCOM extends the PC USB Port to 6 COM ports	CT-MC01

MultiCOM extends the PC by 6 Com ports (RS232). This enables to connect multiple instruments controlled using the RS232 line. Many of the controlled instruments are connected to the PC via serial cables, which need standard 9-pin (male) connector on the computer side. Modern computers usually do not have more than 1 COM port, and notebooks commonly have none. The MultiCOM RS232 to USB converter is connected to the PC via USB port; these are presently common in both desktop PC's and notebooks.



After the installation, the MultiCOM converter will enable the use of six RS232 compliant serial ports ended with standard DB9M connectors. The MultiCOM converter also includes another USB-A connector for the use with any device with low power consumption, for example the Clarity HW key.

The power supply for the MultiCOM converter is normally provided via the USB cable from the computer; however external power supply adapter can also be used.

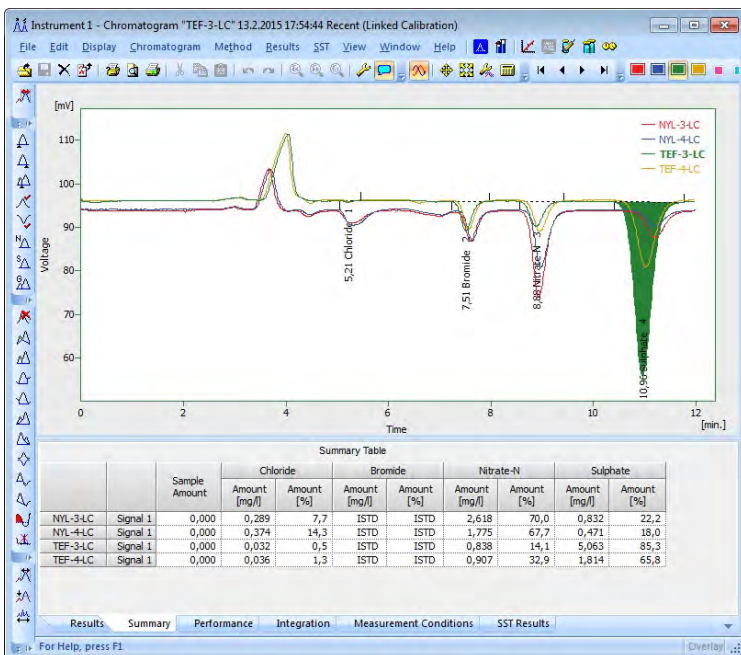
*Requires an A/D converter for data collection

Instrument Window

The Instrument window is the control center of the whole process of data acquisition and evaluation.

Chromatogram Window

The Chromatogram window displays the chromatogram and results. Users can easily review/edit acquired chromatograms visually in the graph or through Integration table. The Result tables (Results, Summary, Column Performance, etc.) can be easily customized to display the data you want exactly the way you want to see it.



TECH TIP

CLARITY CONTROLS

Controls are software modules that provide an interface with chromatography devices such as Gas Chromatographs, HPLC Pumps, Autosamplers or Valves. Direct control means that the device can be controlled from the Clarity environment. Clarity can store various device methods for each type of analysis and then automatically apply them in a sequence. The control options specific for the controlled device are stored in the measured chromatograms. This ensures traceability of measurement conditions.

CONTROLS AVAILABLE FOR:

- GCs
- HPLC Systems
- HPLC Components – Detectors, Pumps, Column Ovens, Autosamplers, Fraction Collectors, Valves
- Amino Acid Analyzers
- Balances

SPECIFICATIONS

Measurement	Simultaneous data acquisition from up to four chromatographs, up to 32 signals.
Data Acquisition	Any detector with voltage output using DataApex A/D converters or selected digital detectors
A/D Converters	External USB
Regulated Environments	A set of tools for meeting GLP/21 CFR Part 11 requirements, including Audit Trails, Electronic Signature, Password protection, User Accounts, etc
Calibration	Internal and external standard calculation methods, calibration of groups of peaks and reference peaks for better identification
Integration	More than 25 parameters programmable in time, automatic reintegration, direct graphical modification of the baseline
Automation	Sequences, Post Run, Batch processing, Event table, command line parameters
Optional Extensions	GPC, PDA, CE, EA, Validation Kit, SST module
Optional Control Modules	Direct Control of selected instruments: GCs, HPLCs, Autosamplers, Valves, Fraction Collectors, Balances, etc.
Data Export	ASCII, AIA, dBase
Data Import	ASCII, AIA
Method of Calibration History	Each chromatogram can be easily displayed under the same conditions as when it was printed, exported or saved

Pickering Post Column Reactors

SPECIFICATIONS

PINNACLE PCX



The **Pinnacle PCX** Sigma Series is part of the complete integrated system of instruments, chemicals, columns, methods and support for post-column derivatization. Each component is specifically designed to optimize the sensitivity and selectivity of post-column analysis.

- ➔ The electronic syringe pump provides true pulse-free flow for superior sensitivity and consistency
- ➔ The pump cylinder and head is made from a single piece of inert ceramic for durability and non-reactivity
- ➔ Electronic valves eliminate troublesome check valves and allow automated pump flushing
- ➔ Inert flow path extends system life and reduces maintenance
- ➔ Column oven temperature gradient programming improves separation and run times—Pinnacle PCX is the only post-column system with this feature

VECTOR PCX



The **Vector PCX** provides the selectivity and sensitivity required for most standard post-column applications while being reliable and easy to use. Designed as a step-up from the previous model PCX5200, the Vector PCX has several improvements and innovations, featuring:

- ➔ Inert pumps
- ➔ PEEK liquid manifolds
- ➔ Integrated gas manifold
- ➔ Easy access and monitoring of fluidics
- ➔ Simple control interface (no computer required)
- ➔ Reduced bench space profile

FEATURES

	PINNACLE	VECTOR
Works with ALL HPLC Systems	Yes	Yes
Components specifically designed for Post-Column Derivatization	Yes	No
Pump Technology	Syringe	Reciprocating
Piston Wash	Automatic	Automatic
Programmable System Flush	Yes	No
Column Oven	Yes	No
Temperature Gradient Column Oven	Yes	No
Automatic Column Oven Cool Down (10 min)	Yes	No
Electronic Valves	Yes	No
Check Valves	No	Yes
Flow Restrictors	No	Yes
Quick Change Reactor Cartridges	Yes	No
All Fluidics on Front Panel	Yes	No
Inert Flow Path	Standard	Custom
LCD Display	Graphical	Text
Full 32 bit PC Control Windows Software	Included	No
Program Storage	Unlimited	No
Network Enables	Yes	No
Remote Diagnostics	Yes	Yes
Reduced Bench Space	Yes	No
Integrated Reagent Tray	Yes	No
Integrated Spill Tray	Yes	No
Integrated Lab Gas Manifold	Yes	Yes
Reduce Maintenance Costs	Yes	No
Reduce Reagent Usage/Costs	Yes	No

APPLICATIONS

	PINNACLE	VECTOR
Aminoglycoside Antibiotics	●	
Amino Acids	●	
Bromate	●	
Biogenic Amines	●	
Carbamate Pesticides	●	●
Chromium VI	●	
Formaldehyde	●	
Glyphosate Herbicide	●	●
Guanidinos	●	●
Hexosamines	●	
Mycotoxins	●	●
Paralytic Shellfish Toxins	●	●
Paraquat & Diquat	●	●
Polyphosphates/Phosphonates	●	
Polyether Antibiotics	●	●
Sulfa Drugs	●	●
Transition/Rare Earth Metals	●	
Trichothecene Mycotoxins	●	●
Vitamins B1, B6	●	

Dimensions: (h x w x d)	21.25" x 10.5" x 18.25" (54 x 26.7 x 46.4 cm)	17" x 8.75" x 16" (43 x 21.6 x 41.2 cm)
Weight:	60 lbs (27.2 Kg) – Duplex	25.3 lbs (11.5 Kg)
Electrical:	100-120V, 50/50 Hz, 1.7A, 200 W or 200-240V, 50/60 Hz, 0.8A, 200 W	
Mains Voltage:	± 10 % of nominal	
REAGENT PUMPS		
Flow Range:	50 µL to 1500 µL/min	0.05 – 2.00 mL/min
Max Pressure:	500 PSI	2,000 PSI
Flow Accuracy:	3%	
Flow Precision:	0.5% RSD	
REACTOR		
Temperature:	41 °F (5 °C) above ambient to 266 °F (130 °C)	
Dwell Volumes:	0.1 – 3 mL	
Safety:	Thermal safety switch limits temperature to 302 °F to prevent damage	
Pressure:	Reaction coil withstands up to 600 PSI (42 bar) inlet pressure at 266 °F	
COLUMN HEATER (PINNACLE PCX ONLY)		
Column	6 or 8 mm OD x 50 – 250 mm in length (column and guard)	N/A
Temperature:	holds within ±1 °C above ambient to 75 °C	N/A

PICKERING POST-COLUMN REACTORS

APPLICATION	REAGENT PUMP	REACTOR VOLUME	VOLTAGE	PART NO
PINNACLE PCX				
Amino Acids (OPA Detection), Aminoglycoside Antibiotics, Biogenic Amines, Polyamines, Paraquat/Diquat	Single	0.15 mL	120 V 240 V	1153-1011 1153-1012
Amino Acids (TRIONE® Ninhydrin detection), Ochratoxin A, Formaldehyde, Bromate	Single	0.5 mL	120 V 240 V	1153-1021 1153-1022
Mycotoxins including Aflatoxins & Fumonisin	Single	Knitted 1.4 mL	120 V 240 V	1153-1031 1153-1032
Cholesterol	Single	Knitted 2.8 mL	120 V 240 V	1153-1041 1153-1042
Carbamate Pesticide, Glyphosate Herbicide, Streptomycin, (OPA detection)	Dual	0.5 mL	120 V 240 V	1153-1051 1153-1052
Paralytic Shellfish Toxins	Dual	Knitted 1.0 mL	120 V 240 V	1153-1061 1153-1062
Trichothecene Mycotoxins	Dual	Knitted 1.2 & 1.6 mL	120 V 240 V	1153-1071 1153-1072
Polyether Antibiotics	Dual	Knitted 1.4 mL	120 V 240 V	1153-1081 1153-1082
Voglibose Analysis	Single	Knitted 3.5 mL	120 V 240 V	1153-1101 1153-1102
Chromium VI, includes Dead-head Pressure Transducer	Single	Knitted 1.0 mL	120 V 240 V	1153-1103 1153-1104
Alprostadiol Analysis, includes Dead-head Pressure Transducer	Single	Knitted 2.0 mL	120 V 240 V	1153-1105 1153-1106
Pinnacle Dead-head upgrade kit for Pinnacle pressure transducer, recommended when applications call for highly corrosive reagents				1552-0040
VECTOR PCX				
Carbamate Pesticides, Glyphosate Herbicide, Streptomycin, (OPA detection)	Dual	0.5 mL	120 V 240 V	1154-4051 1154-4052
Streptomycin	Dual	0.5 mL	120 V 240 V	1154-4001 1154-4002
Paralytic Shellfish Toxins	Dual	Knitted 1.0 mL	120 V 240 V	1154-4061 1154-4062
Trichothecene Mycotoxins	Dual	Knitted 1.2 mL and 1.6 mL	120 V 240 V	1154-4071 1154-4072
Polyether Antibiotics	Inert PEEK Dual	Knitted 1.4 mL	120 V 240 V	1154-4081 1154-4082
Voglibose Analysis	Single	Knitted 3.5 mL	120 V 240 V	1154-4101 1154-4102
Amino Acids (OPA detection), Aminoglycoside Antibiotics, Biogenic Amines	Single	0.15 mL	120 V 240 V	1154-4011 1154-4012
Amino Acids (TRIONE® Ninhydrin detection), Ochratoxin A, Formaldehyde, Bromate	Single	0.5 mL	120 V 240 V	1154-4021 1154-4022
Aflatoxins Analysis	Single	Knitted 1.4 mL	120 V 240 V	1154-4031 1154-4032

Safeguards

Post-column Reagent Backflow

Vector PCX: A pressure switch installed between LC (eluent) pump and sample injector turns off power to reagent pumps and reactor when the pump pressure drops to 425 PSI, ensuring reagent will not flow upstream and damage the column. The Vector PCX will not restart automatically.

Pinnacle PCX: In-line check valve: Prevents reagent back flow into the column when HPLC pressure drops.

Post-column System Over-pressure

A relief valve pre-calibrated to open at 485 PSI prevents rupture of the post-column reactor tubing in the event of downstream blockage, and reduces the possibility that all or part of the reagent flow will be diverted to the column.

Detector Noise, Precipitation

Back-pressure regulator applies 7 bar (100 PSI) to the detector noise and precipitation due to solvent outgassing or boiling adjustable (2 – 10 bar).

TECH TIP

PINNACLE DEAD-HEAD PRESSURE TRANSDUCER

Some post-column applications call for highly corrosive reagents, which will damage the Pinnacle pressure transducer. We now have a dead-head kit available for the Pinnacle pressure transducer. This will allow you to record the reagent pressure without passing corrosive reagent through the pressure transducer. A dead-head upgrade kit is available or you can purchase a brand new Pinnacle pre-plumbed with the dead-headed pressure transducer.

Next Generation Column Oven (sold separately)

Since Vector PCX does not have a column oven it is important to use an HPLC column oven to ensure stable column temperature and prevent retention time drifts and separation problems.



NEXT GENERATION COLUMN OVEN

PART NO	DESCRIPTION
H-705	Next Generation Column Oven



See Next Generation Column Oven (pg 310)

AMINO ACID ANALYSIS KITS	
PART NO	DESCRIPTION
0352-0061	30-MINUTE HIGH EFFICIENCY COLLAGEN HYDROLYSATE KIT:
1154110T	30-Minute Sodium Cation-exchange Column 4.6 x 110 mm & 1700-0070 amino acid test mixture
1700-3102	Cation-exchange GARD™ assy: Holder w/2 replaceable GARD™
Na220	Sodium Diluent, pH 2.20, 4 x 250 mL
Na315	Sodium Eluent, pH 3.15, 4 x 950 mL
Na425	Sodium Eluent, pH 4.25
Na640	Sodium Eluent, pH 6.40
RG011	Sodium Column Regenerant, 950 mL
T100C	TRIONE® Ninhydrin Reagent, 4 x 950 mL (4-month shelf life)
012506C	Sodium Calibration Standard, for collagen hydrolysate, 0.25 µmole/mL, 5 mL
0352-0062	KIT IDENTICAL TO 0352-0061 WITH T200 REPLACING T100C:
T200	TRIONE® Two-part Ninhydrin Reagent, prepares 4 x 900 mL
0352-0063	KIT IDENTICAL TO 0352-0061 WITH ITEMS BELOW REPLACING T100C:
OD104	OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
0352-0057	30-MINUTE HIGH EFFICIENCY PROTEIN HYDROLYSATE KIT:
1154110T	30-Minute Sodium Cation-exchange Column 4.6 x 110 mm & 1700-0070 amino acid test mixture
1700-3102	Cation-exchange GARD™ assy: Holder w/ 2 replaceable GARD™
Na220	Sodium Diluent, pH 2.20, 4 x 250 mL
Na315	Sodium Eluent, pH 3.15, 4 x 950 mL
Na425	Sodium Eluent, pH 4.25
Na640	Sodium Eluent, pH 6.40
RG011	Sodium Column Regenerant, 950 mL
T100C	TRIONE® Ninhydrin Reagent, 4 x 950 mL (4-month shelf life)
012506H	Sodium Calibration Standard, for protein hydrolysate, 0.25 µmole/mL, 5 mL
0352-0058	KIT IDENTICAL TO 0352-0057 WITH T200 REPLACING T100C:
T200	TRIONE® Two-part Ninhydrin Reagent, prepares 4 x 900 mL
0352-0059	KIT IDENTICAL TO 0352-0057 WITH ITEMS BELOW REPLACING T100C:
OD104	OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
0352-0020	30-MINUTE HIGH EFFICIENCY OXIDIZED FEED HYDROLYSATE KIT:
1154110T	30-Minute Sodium Cation-exchange Column 4.6 x 110 mm & 1700-0070 amino acid test mixture
1700-3102	Cation-exchange GARD™ assy: Holder w/ 2 replaceable GARD™
Na220	Sodium Diluent, pH 2.20, 4 x 250 mL
Na270	Sodium Eluent, pH 2.70, 4 x 950 mL
Na425	Sodium Eluent, pH 4.25
Na640	Sodium Eluent, pH 6.40
RG011	Sodium Column Regenerant, 950 mL
T100C	TRIONE® Ninhydrin Reagent, 4 x 950 mL (4-month shelf life)
1700-0155	Sodium Calibration Standard, for oxidized feed hydrolysate, 0.25 µmole/mL, 5 mL
0352-0021	KIT IDENTICAL TO 0352-0020 WITH T200 REPLACING T100C:
T200	TRIONE® Two-part Ninhydrin Reagent, prepares 4 x 900 mL

AMINO ACID ANALYSIS KITS (CONTINUED)	
PART NO	DESCRIPTION
0352-0022	KIT IDENTICAL TO 0352-0020 WITH ITEMS BELOW REPLACING T100C:
OD104	OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
AT30SH	STANDARD 60-MINUTE PROTEIN HYDROLYSATE KIT:
1193250	Sodium Ion-exchange Column, 3.0 x 250 mm (with test mixture 1700-0070)
1700-3102	Cation-exchange GARD™ assy: Holder w/ 2 replaceable GARD™
Na328	Sodium Eluent, pH 3.28, 4 x 950 mL
Na740	Sodium Eluent, pH 7.40, 4 x 950 mL
T100C	TRIONE® Ninhydrin Reagent, 4 x 950 mL (3-month shelf life)
RG011	Sodium Column Regenerant, 950 mL
Na220	Sodium Diluent, pH 2.20, 4 x 250 mL
012506H	Sodium Calibration Standard, for protein hydrolysate, 0.25 µmole/mL, 5 mL
0352-0030	KIT IDENTICAL TO AT30SH WITH T200 REPLACING T100C:
T200	TRIONE® Two-part Ninhydrin Reagent, prepares 4 x 900 mL
AO30SH	KIT IDENTICAL TO AT30SH WITH ITEMS BELOW REPLACING T100C:
OD104	OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
1154150T	Sodium Ion-exchange Column, 4.0 x 150 mm (w/test mixture 1700-0070)
1700-3102	Cation-exchange GARD™ assy: Holder w/ 2 replaceable GARD™
Na315	Sodium Eluent, pH 3.15, 4 x 950 mL
Na740	Sodium Eluent, pH 7.40, 4 x 950 mL
T100C	TRIONE® Ninhydrin Reagent, 4 x 950 mL (3-month shelf life)
RG011	Sodium Column Regenerant, 950 mL
Na220	Sodium Diluent, pH 2.20, 4 x 250 mL
012506H	Sodium Calibration Standard, for protein hydrolysate, 0.25 µmole/mL, 5 mL
0352-0031	KIT IDENTICAL TO AT31FH WITH T200 REPLACING T100C:
T200	TRIONE® Two-part Ninhydrin Reagent, prepares 4 x 900 mL
AO31FH	KIT IDENTICAL TO AT31FH WITH ITEMS BELOW REPLACING T100C:
OD104	OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
AT32FC	HIGH-EFFICIENCY 55-MINUTE COLLAGEN HYDROLYSATE KIT:
1154150T	Sodium Ion-exchange Column, 4.0 x 150 mm (with test mixture 1700-0070)
1700-3102	Cation-exchange GARD™ assy: Holder w/ 2 replaceable GARD™
AT31FH	HIGH-EFFICIENCY 55-MINUTE PROTEIN HYDROLYSIS KIT:
Na315	Sodium Eluent, pH 3.15, 4 x 950 mL
Na740	Sodium Eluent, pH 7.40, 4 x 950 mL
T100C	TRIONE® Ninhydrin Reagent, 4 x 950 mL (3-month shelf life)
AT31FH	HIGH-EFFICIENCY 55-MINUTE PROTEIN HYDROLYSIS KIT (CONT.):
RG011	Sodium Column Regenerant, 950 mL
Na220	Sodium Diluent, pH 2.20, 4 x 250 mL
012506C	Sodium Calibration Standard, for collagen hydrolysate 0.25 µmole/mL, Proline and Hydroxyproline, 1.25 µmole/mL, 5 mL

AMINO ACID ANALYSIS KITS (CONTINUED)	
PART NO	DESCRIPTION
0352-0032	KIT IDENTICAL TO AT32FC WITH T200 REPLACING T100C:
T200	TRIONE® Two-part Ninhydrin Reagent, prepares 4 x 900 mL
AO32FC	KIT IDENTICAL TO AT32FC WITH ITEMS BELOW REPLACING T100C:
OD104	OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
0352-0018	60-MINUTE OXIDIZED FEED HYDROLYSATE KIT:
1154150T	Sodium Ion-exchange Column, 4.0 x 150 mm (with test mixture 1700-0070)
1700-3102	Cation-exchange GARD™ assy: Holder w/ 2 replaceable GARD™
Na270	Sodium Eluent, pH 2.70, 4 x 950 mL
Na740	Sodium Eluent, pH 7.40, 4 x 950 mL
T100C	TRIONE® Ninhydrin Reagent, 4 x 950 mL (3-month shelf life)
RG011	Sodium Column Regenerant, 950 mL
Na220	Sodium Diluent, pH 2.20, 4 x 250 mL
1700-0155	Sodium Calibration Standard, for oxidized feed hydrolysate, 0.25 µmole/mL, 5 mL
0352-0017	KIT IDENTICAL TO 0352-0018 WITH T200 REPLACING T100C:
T200	TRIONE® Two-part Ninhydrin Reagent, prepares 4 x 900 mL
0352-0019	KIT IDENTICAL TO 0352-0018 WITH ITEMS BELOW REPLACING T100C:
OD104	OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
0352-0006	70-MINUTE PHYSIOLOGIC FLUID/NATIVE SAMPLE KIT:
0354675T	Lithium Ion-exchange Column, 4.6 x 75 mm (with test mixture 1700-0070)
1700-3102	Cation-exchange GARD™ assy: Holder w/ 2 replaceable GARD™
1700-1125	Lithium Eluent, pH 2.80, 4 x 950 mL
Li220	Lithium Diluent, pH 2.20, 4 x 250 mL
Li365	Lithium Diluent, pH 3.65, 4 x 950 mL
Li375	Lithium Diluent, pH 3.75, 4 x 950 mL
RG003	Lithium Column Regenerant, 950 mL
1700-0170	Lithium Calibration Standard, without Norleucine and AGPA, 0.25 µmole/mL, 5 mL
SP100	SERAPREP™, 250 mL
UP100	URIPREP™, 250 mL
T100C	TRIONE® Ninhydrin Reagent, 4 x 950 mL (3-month shelf life)
0352-0007	KIT IDENTICAL TO 0352-0006 WITH T200 REPLACING T100C:
T200	TRIONE® Two-part Ninhydrin Reagent, prepares 4 x 900 mL
0352-0008	KIT IDENTICAL TO 0352-0006 WITH ITEMS BELOW REPLACING T100C:
OD104	OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
0352-0008	KIT IDENTICAL TO 0352-0006 WITH ITEMS BELOW REPLACING T100C:
OD104	OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
AT33SP	STANDARD 185-MIN. PHYSIOLOGIC FLUID/NATIVE SAMPLE KIT:
0393250	Lithium Ion-exchange Column, 3.0 x 250 mm (with test mixture 1700-0070)

AMINO ACID ANALYSIS KITS (CONTINUED)	
PART NO	DESCRIPTION
AT33SP	STANDARD 185-MIN. PHYSIOLOGIC FLUID/NATIVE SAMPLE KIT (CONT.):
1700-3102	Cation-exchange GARD™ assembly: Holder w/ 2 replaceable GARD™s
Li275	Lithium Eluent, pH 2.75, 4 x 950 mL
Li750	Lithium Eluent, pH 7.50, 4 x 950 mL
T100C	TRIONE® Ninhydrin Reagent, 4 x 950 mL (3-month shelf life)
RG003	Lithium Column Regenerant, 950 mL
Li220	Lithium Diluent, pH 2.36, 4 x 250 mL
011006P	Lithium Calibration Standard, with norleucine, 0.25 µmole/mL, 5 mL
SP100	SERAPREP™, 250 mL
UP100	URIPREP™, 250 mL
0352-0033	KIT IDENTICAL TO AT33SP WITH T200 REPLACING T100C:
T200	TRIONE® Two-part Ninhydrin Reagent, prepares 4 x 900 mL (12-month shelf life)
AO33SP	KIT IDENTICAL TO AT33SP WITH ITEMS BELOW REPLACING T100C:
OD104	OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
0352-0015	HIGH-EFFICIENCY 120-MIN. PHYSIOLOGIC FLUID/NATIVE SAMPLE KIT:
0354100T	Lithium Ion-exchange Column, 4.0 x 100 mm (with test mixture 1700-0070)
1700-3102	Cation-exchange GARD™ assembly: Holder w/ 2 replaceable GARD™s
Li275	Lithium Eluent, pH 2.75, 4 x 950 mL
Li750	Lithium Eluent, pH 7.50, 4 x 950 mL
T100C	TRIONE® Ninhydrin Reagent, 4 x 950 mL (3-month shelf life)
RG003	Lithium Column Regenerant, 950 mL
Li220	Lithium Diluent, pH 2.36, 4 x 250 mL
011006P	Lithium Calibration Standard, with norleucine, 0.25 µmole/mL, 5 mL
SP100	SERAPREP™, 250 mL
UP100	URIPREP™, 250 mL
0352-0011	KIT IDENTICAL TO 0352-0015 WITH T200 REPLACING T100C:
T200	TRIONE® Two-part Ninhydrin Reagent, prepares 4 x 900 mL
0352-0012	KIT IDENTICAL TO 0352-0015 WITH ITEMS BELOW REPLACING T100C:
OD104	OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
0352-0013	TEMPERATURE GRADIENT PHYSIOLOGIC FLUID/NATIVE SAMPLE KIT:
0354100T	Lithium Ion-exchange Column, 4.0 x 100 mm (with test mixture 1700-0070)
1700-3102	Cation-exchange GARD™ assembly: Holder w/ 2 replaceable GARD™
1700-1125	Lithium Eluent, pH 2.80, 4 x 950 mL
Li220	Lithium Diluent, pH 2.20, 4 x 250 mL
Li365	Lithium Diluent, pH 3.65, 4 x 950 mL
Li375	Lithium Diluent, pH 3.75, 4 x 950 mL
RG003	Lithium Column Regenerant, 950 mL
1700-0170	Lithium Calibration Standard, without Norleucine and AGPA, 0.25 µmole/mL, 5 mL
SP100	SERAPREP™, 250 mL
UP100	URIPREP™, 250 mL
T100C	TRIONE® Ninhydrin Reagent, 4 x 950 mL (3-month shelf life)

AMINO ACID ANALYSIS KITS (CONTINUED)	
PART NO	DESCRIPTION
0352-0014	KIT IDENTICAL TO 0352-0013 WITH T200 REPLACING T100C:
T200	TRIONE® Two-part Ninhydrin Reagent, prepares 4 x 900 mL
0352-0016	KIT IDENTICAL TO 0352-0013 WITH ITEMS BELOW REPLACING T100C:
OD104	OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)

PESTICIDE & HERBICIDE ANALYSIS KITS	
PART NO	DESCRIPTION
0352-0002	CARBAMATE PESTICIDES ANALYSIS KIT, 23+ COMPOUNDS
0840250	Carbamate Column, expanded resolution, 4.0 x 250 mm (with Carbamate Test Mixture 1700-0063)
18ECG001	Guard Cartridge Holder with 3 guard cartridges
CB130	Carbamate Hydrolysis Reagent, 4 x 950 mL
CB910	Carbamate OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
1700-0132	ChlorAC™ Buffer, 250 mL
0352-0003	CARBAMATE PESTICIDES ANALYSIS KIT, FOR EPA METHOD 531.1:
18ECG001	Guard Cartridge Holder with 3 guard cartridges
CB130	Carbamate Hydrolysis Reagent, 4 x 950 mL
CB910	Carbamate OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
1700-0132	ChlorAC™ Buffer, 250 mL
0352-0009	CARBAMATE PESTICIDES ANALYSIS KIT, FOR EPA METHOD 531.2:
18ECG001	Guard Cartridge Holder with 3 guard cartridges
CB130.2	Carbamate Hydrolysis Reagent, 4 x 950 mL
CB910	Carbamate OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
1700-0132	ChlorAC™ Buffer, 250 mL
0352-0004	CARBAMATE PESTICIDES ANALYSIS KIT, FOR AOAC METHOD 985.23:
1846150	Analytical Column, rapid analysis/QC, 4.6 x 150 mm (with Carbamate Test Mixture 1700-0063)
18ECG001	Guard Cartridge Holder with 3 guard cartridges
CB130	Carbamate Hydrolysis Reagent, 4 x 950 mL
CB910	Carbamate OPA Diluent, 4 x 950 mL
0352-0040	BIOGENIC AMINES/POLYAMINES ANALYSIS KIT:
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
1700-0132	ChlorAC™ Buffer, 250 mL

PESTICIDE & HERBICIDE ANALYSIS KITS (CONTINUED)	
PART NO	DESCRIPTION
0352-0010	GLYPHOSATE HERBICIDE ANALYSIS KIT, FOR EPA METHOD 547, AOAC METHOD 991.08:
1954150	Cation-exchange Column, K+ form, 4.0 x 150 mm (with Glyphosate Test Mixture 1700-0080)
1700-3102	Cation-exchange GARD™ assy: Holder w/ 2 replaceable GARD™
K200	Glyphosate Potassium Phosphate Eluent, 4 x 950 mL
RG019	Glyphosate Column Regenerant, 950 mL
GA104	Glyphosate OPA Diluent, 4 x 950 mL
GA116	Glyphosate Hypochlorite Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
1700-0140	RESTORE™, 250 mL
9410917	ALKION™ Cation-exchange Column, K+ form, 4.0 x 150 mm
9493020	ALKION™ Guard Column, K form, 3.0 x 20 mm
1100-0200	Flow Restrictor, 300 PSI, 10 cm
K563	Potassium Phosphate Eluent, pH 5.63, 4 x 950 mL
K600	Potassium Phosphate Eluent, pH 6.00, 4 x 950 mL
K130	Potassium Column Regenerant, 950 mL
OD104	OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
0352-0041	AMINOGLYCOSIDE ANTIBIOTICS ANALYSIS KIT:
9410917	ALKION™ Cation-exchange Column, K form, 4.0 x 150 mm
9493020	ALKION™ Guard Column, K form, 3.0 x 20 mm
1100-0200	Flow Restrictor, 300 PSI, 10 cm
1700-1101	Potassium Phosphate Eluent, KO1, 4 x 950 mL
1700-1102	Potassium Hydroxide Eluent, KO2, 4 x 950 mL
1700-1103	Potassium Chloride Eluent, KO3, 4 x 950 mL
OD104	OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
3700-2000	Thiofluor™, 10 g (2 ea per kit)
0352-0042	PARAQUAT/DIQUAT IN WATER ANALYSIS KIT:
9410917	ALKION™ Cation-exchange Column, K form, 4.0 x 150 mm
9493020	ALKION™ Guard Column, K+ form, 3.0 x 20 mm
1100-0200	Flow Restrictor, 300 PSI, 10 cm
1700-1101	Potassium Phosphate Eluent, KO1, 4 x 950 mL
1700-1102	Potassium Hydroxide Eluent, KO2, 4 x 950 mL
1700-1103	Potassium Chloride Eluent, KO3, 4 x 950 mL
0352-0053	MULTI-RESIDUE MYCOTOXIN KIT :
1612124	MYCOTOX™ Reversed-phase Column, 4.6 x 250 mm
18ECG001	Guard Cartridge Holder with 3 cartridges
OD104	OPA Diluent, 4 x 950 mL
O120	o-Phthalaldehyde, 5 g
1700-1108	Sodium Phosphate Eluent, pH 3.3
3700-2000	Thiofluor™, 10 g (2 ea per kit)
0352-0050	AFLATOXIN ANALYSIS KIT:
1612124	MYCOTOX™ Reversed-phase Column, 4.6 x 250 mm
18ECG001	Guard Cartridge Holder with 3 cartridges
0352-0051	POLYETHER ANTIBIOTICS KIT:
2381750	Polyether Column, 4.6 x 250 mm
18ECG001	Guard Cartridge Holder with 3 cartridges
3700-2200	Vanillin, 30 g

Sensivate Post-Column Reactor

- ➔ Disposable reactor cartridges
- ➔ All PEEK fluid path
- ➔ All connections accessible from front panel—ease of maintenance
- ➔ Upper/lower pressure and temperature limits, and system shutdown relay
- ➔ Reactor designed to reduce band broadening—not just a coil



PUMP SPECIFICATIONS

Flow rates:	0.01 – 2.50 mL/min
Pressure:	0 – 2,000 PSI (138 bar)
Flow Accuracy:	± 3% from set point
Flow Precision:	< 0.5% RSD
Materials:	All PEEK fluid path, including pump heads
Dimensions (h x w x d):	11.8" x 10.5" x 17" (30 x 27 x 43 cm)
Weight:	54 lbs (14 kg)
Electrical	120/230 VAC, 50/60 Hz
Input:	RS-232

- ➔ Automatic piston wash (significantly improves seal life)
- ➔ Back Pressure Coil for proper Pulse Dampener operation (approx. 1,000 PSI @ 1.0 mL/min)
- ➔ Interactive front keypad with digital read-out:
 - Flow rate set points
 - Pressure readout
 - Set upper/lower pressure limit

REACTOR SPECIFICATIONS

Temp. Operating Range:	10 – 150 °C above ambient
Temp. Accuracy:	± 2 °C over entire range (outlet fluid temperature vs set point)
Temp. Repeatability:	± 1 °C
Safety Cutoff Temp.:	160 °C
Stabilizing Time:	60 minutes to 150 °C for "Ready" indication
Input:	RS-232

- ➔ Continuous loop, fully sealed
- ➔ Multi-directional path for effective mixing
- ➔ Interactive front keypad control with digital display and ready light
 - Temperature set point
 - Temperature display

Modular Design

The Sensivate's modular design means you can configure your own system. To configure your part number, choose one option from columns 1 and 2. If second reactor is required, choose option from column 3.

SENSIVATE POST-COLUMN REACTOR

CHOOSE:	1. PCR SYSTEM	2. REACTOR BLOCK 1 (HEATED)	3. OPTIONAL REACTOR BLOCK 2 (AMBIENT)
	PCR0 = Post Column Reactor Unit	R015 = 0.15 mL Reactor	R015 = 0.15 mL Reactor
	PCR1 = Single Reagent Post Column System (1 pump)	R050 = 0.50 mL Reactor	R050 = 0.50 mL Reactor
	PCR2 = Dual Reagent Post Column System (2 pumps)	R140 = 1.40 mL Reactor	R140 = 1.40 mL Reactor
		<i>For custom reactor size: RXXX = XXX mL Reactor Vol</i>	<i>For custom reactor size: RXXX = XXX mL Reactor Vol</i>



POPULAR SENSIVATE CONFIGURATIONS

PART NO	1. PCR SYSTEM	2. REACTOR BLOCK 1 (HEATED)	3. OPTIONAL REACTOR BLOCK 2 (AMBIENT)
PCR0-R050	PCR0 – Post Column Reactor Unit	R050 – 0.50 mL Reactor	N/A
PCR1-R015	PCR1 – Single Reagent Post Column System	R015 – 0.15 mL Reactor	N/A
PCR1-R050	PCR1 – Single Reagent Post Column System	R050 – 0.50 mL Reactor	N/A
PCR1-R140	PCR1 – Single Reagent Post Column System	R140 – 1.40 mL Reactor	N/A
PCR1-R200	PCR1 – Single Reagent Post Column System	R200 – 2.0 mL Reactor	N/A
PCR2-R050-R015	PCR2 – Dual Reagent Post Column System	R050 – 0.50 mL Reactor	R015 – 0.15 mL Reactor
PCR2-R140-R140	PCR2 – Dual Reagent Post Column System	R140 – 1.40 mL Reactor	R140 – 1.40 mL Reactor
PCR2-R200	PCR2 – Dual Reagent Post Column System	R200 – 2.0 mL Reactor	N/A

ACCESSORIES

PART NO	DESCRIPTION
160808	Sparging Option Assembly, Includes 2 multi-valve bottle caps, 1 pressure regulator, mounting hardware, tubing, fittings. Bottles not included.
160819	Pressure Control Switch

LC Instrument Replacement Parts

Chrom Tech/SSI Parts	330	Instrument	350
Chrom Tech/SSI Pump Replacement Parts	330	Replacement Parts by Instrument Vendor	
Alltech Pump Replacement Parts	331	Introduction to ASI, Analytical Scientific Instruments	350
Misc. Chrom Tech Pump Supplies	331	Introduction to Optimize Technologies For Agilent/HP Instruments	351
Agilent Parts & Supplies for Agilent Instrumentation	332	For Beckman/Altex Instruments	353
1260 Infinity Isocratic LC Supplies	332	For PerkinElmer Instruments	355
Purge Valves	333	For Shimadzu Instruments	356
Inlet & Outlet Vales	333	For Thermo Scientific Instruments	358
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Featured Products

331 Alltech Pump Replacement Parts

Have an Alltech Pump?
Chrom Tech has original
manufactured replacement parts

Contact Chrom Tech Support
Desk for help choosing parts—
support@chromtech.com

335 Agilent Solvent Filters

5041-2168

5062-8517



342 Agilent Long Life Lamps

5182-1530



CHROM TECH RELATED PRODUCTS



JT-PP12755

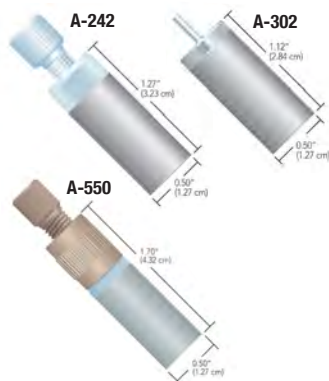


JT-TF12752-CC1



6 Port Manifold Vapor Filter

Chrom Tech Solvent Waste Container Kit, page 262



Upchurch Scientific General Use Inlet Stainless
Steel Solvent Filters, page 268

412-0150



412-0150B



ASI Static Mixers, page 245

Female Ports are 10-32 Coned
accept 1/16" OD tubing
Standard Assemblies are rated
to 5,000 PSI. UHPLC Assemblies
are rated to 15,000 PSI

Notes from the Support Desk
(continued on next page)

Notes from the Support Desk

HPLC Pump Trouble Shooting Guide

The following trouble shooting guide has been prepared by ASI for the novice as well as experienced service technicians. Often it is more expensive to simply replace old parts with new ones and get back to work, but, for the chromatographer who doesn't have the budget for that, or who is down on a weekend with no spare parts, we hope these tips get you HPLC pump up and running, and keep it running.

PROBLEM	CAUSE	REMEDY
Erratic Pressure	Dirty inlet valve	Remove inlet valve and flush with 50 mL of clean HPLC grade solvent.
	Dirty outlet valve	Replace with new valve (an inlet cartridge can be substituted for an outlet if no outlet valves are available). If there is no filter on the outlet, then it may be cleaned in the same manner as an inlet.
	Clogged solvent intake filter	Replace with new filter.
	Leak at solvent inlet line	Tighten fitting. Replace ferrule and fitting if no longer serviceable.
	<i>Note: This problem may not be easy to detect! On the intake side of the pump there is a slight vacuum, so air will leak into the pump rather than solvent leaking out. There will be no visible sign of a leak. To detect this problem make sure that there is no air in the intake lines, then open the outlet fitting and watch for air bubbles coming out (place a drop of solvent at the outlet fitting to observe air bubbles). If you continue to observe air bubbles after 60 seconds, then air is probably entering the head from the inlet fitting, a leaky pump seal, or an insufficiently tightened inlet housing.</i>	
	Worn pump seal or piston	Replace seal. Inspect piston and replace if worn.
	<i>Note: If your piston is worn, you can sometimes get a PTFE seal to work for a short time, until a new piston can be obtained. PTFE will generally conform to and seal with a worn piston better than UHMW-PE, but not for long. Also, PTFE will generate copious amounts of wear material when used with a worn piston. Replace the worn piston ASAP.</i>	
	Air in pump head	Purge pump for 30 seconds, then operate at 1,000 PSI or higher. The air will dissolve in the solvent and be expelled within about 30 minutes.
	<i>Note: This symptom is normal after replacing a pump seal or piston. Wet the seal and inside of the pump head with IPA to reduce the amount of time it takes to eliminate air from the head.</i>	
	Not using degassed solvents	Degas, preferably using vacuum and sonication
Frequent Check Valve Failure	Air bubbles in inlet line	Degas solvent. Replace solvent inlet filter. Make sure solvent bottle still has solvent!
	Contaminated solvent	Use clean HPLC grade solvent.
	No solvent inlet filter	Always use 10 micron or finer solvent filter.
	Worn pump seal or Piston	Replace seal. Inspect piston and replace if worn.
	<i>Note: If the seal is badly worn, then the pump head will be contaminated with seal wear material. Remove the check valves and seal from head and sonicate the head in 20% nitric acid for 30 minutes. Rinse thoroughly, then sonicate for 10 minutes in DI water. Wet seal and pump head with IPA prior to reassembly. The inlet valve should be flushed with 50 mL of HPLC grade IPA or Water, and the outlet valve filter inspected (if there is no filter on the outlet, then flush with 50 mL HPLC solvent).</i>	
Failure to Prime	Service life of check valves has been exceeded	Install new valves.
	Excess back pressure in pump head	Open purge valve, or open fittings at outlet check valve.
	Valve installed upside down	Verify that arrow faces up for both inlet and outlet valve.
	Clogged solvent inlet filter	Clean or replace with new filter.
	Clogged outlet valve filter	Replace outlet valve filter.
<i>Note: The outlet valve filter should last at least 2 years in normal service. However, if piston seals are wearing out frequently, then wear material from the seal may cause premature clogging of the outlet frit, as well as contaminating the inlet valve. Replace the outlet filter, and inspect the sapphire piston for wear or score marks.</i>		

Notes from the Support Desk

HPLC Pump Trouble Shooting Guide (cont.)

PROBLEM	CAUSE	REMEDY
Operating Pressure is Lower than Normal	Worn seal or piston	Replace seal. Inspect piston and replace if worn.
	Air in pump head or intake line	Purge pump for 30 seconds, then operate at 1,000 PSI or higher. The air will dissolve in the solvent and be expelled within about 30 minutes.
	Clogged solvent inlet filter	Clean or replace with new filter.
	Dirty inlet valve	Remove inlet valve and flush with 50 mL of clean HPLC grade solvent.
	Dirty outlet valve	Replace with new valve (an inlet cartridge can be substituted for an outlet if no outlet valves are available). If there is no filter on the outlet, then it may be cleaned in the same manner as an inlet.
	Leaky fitting	Tighten fitting. Replace ferrule if badly deformed.
	<i>Note: If a slight amount of additional tightening does not slow stop the leak, then replace the ferrule. Over-tightening the fitting can damage the seat, strip the threads, or worse, cause the nut to shear off. Never exceed 15 in-lbs of torque.</i>	
Seal Life Unusually Short	Worn or scratched piston	Replace with new piston.
	<i>Note: It is not always obvious by visual inspection if a piston is worn or scratched. Use a magnifying glass to look for a glazed appearance, or axial grooves and scratches. The piston is badly worn if any such conditions are visible.</i>	
	Build-up of salts on piston	Use the piston flush option if available. Always run DI water through the pump before shutting down for the day when running buffers.
	Mobile phase incompatible with seal material	Use a PTFE seal.

ASI Replacement Piston Seals | Selecting the Best Material for your Application

UHMWPE Compound

This material is based on ultra-high molecular weight polyethylene, and is compounded with other proprietary polymers to provide better lubricity and solvent resistance than pure UHMWPE. This material is a self-lubricating compound that exhibits excellent wear characteristics, low coefficient of friction, and good resistance to cold-flow (extrusion). It is often used for “dry” bearings and seals, where lubrication by oil or other fluids is not permitted. It is resistant to most HPLC solvents except for methylene chloride and toluene. UHMWPE seals should only be used intermittently when using these solvents in 100% concentration. ASI offers two different formulations of this material. One is a gold color and the other is white. The gold material is slightly stiffer than the white material, while the white material exhibits a slightly lower coefficient of friction. The formulation that we feel is most suitable for a specific pump model is the only formulation of UHMWPE that we offer for that pump model. There are many different UHMWPE formulations that appear the same color, but they are not all the same.

PTFE Compound

This material is PTFE with a filler added to it for the purpose of increasing resistance to cold flow and improving wear characteristics. It is absolutely inert to any hplc solvent, but does not have the high resistance to wear and cold-flow that the UHMWPE compounds have. It is more flexible than UHMWPE, and therefore will conform better with pistons that are not aligned well, or which are worn flat. The color of our formulation is black. There are dozens of PTFE compounds, many of which are black, but they are not all the same. Some offer an extremely low coefficient of friction but wear rapidly, while others last longer but can rapidly wear the sapphire piston (such as ceramic filled PTFE). The selection of the PTFE compound that we use is based on thousands of hours of testing of compounds from several different suppliers, and we are confident that it offers the best performance.

Conclusion

In general we recommend using our UHMWPE compound. It generates less wear material than PTFE, tends to act as a better bearing to help align the piston, and has a much longer service life than PTFE. Always inspect the piston for signs of scoring or wear when replacing seals. If your piston is worn or scratched, replace it, because nothing will destroy a seal faster than a worn or scratched piston.

Chrom Tech/SSI Pump Replacement Parts

MAX PUMP FLOW RATES	5-6 mL/min	10 – 12 mL/min	10 mL/min	30 – 50 mL/min	40 mL/min
FOR LEGACY PUMPS:	P-1500, Q-Grad, Essence, P-2500	P-1010(B), P-2010(B), P-1524CP, P-2024(B), Series 2, Series 3, Constant Pressure, Flash 2000	P-010(S), Series 1	P-1040(B), P-2040(B), P-2100 (B), P-1100, Series 2, 3, Flash 2000, Prep 100	P-040(S), Series 1
PUMP HEAD MODEL	L HEAD	M HEAD	MM HEAD	H HEAD	MH HEAD
FOR NEXT GENERATION PUMPS:	PBD-LST05(S/B), PB-LST05(S/B), P-LL05(S/B), P-LST05(S/B), P-LS05(S/B), P-CP12S	PBD-LST10(S/B), PB-LST10(S/B), P-LL10(S/B), P-LST10(S/B), P-LS10(S/B), P-LD12(S/B), P-LD36(S/B), P-CP24S	P-ML10(S/B), P-MX10(S/B), P-MXT10(S/B), P-MXT10B-MS, P-M110(S/B)	PBD-LST40(S/B), PB-LST40(S/B), P-LL40(S/B), P-LST40(S/B), P-LS40(S/B), P-LD100(S/B), P-PR100(S/B), P-CP100S, P-0100F(B)	P-ML40(S/B), P-MX40(S/B), P-MXT40(S/B), P-M140(S/B)
Piston assembly, ea	P-1597	P-1097	P-0101	P-1198	P-1298
Standard piston seal kit, ea	P-1595	P-1095	P-0103	P-1096	P-1295
Standard piston seals, 10/pk	P-1591	P-1090	—	P-3003	—
● Biocompatible piston seal kit*, ea	P-1595B	P-1095B	P-0103B	P-1096B	P-1295B
Piston seal kit, Organic, ea	P-1599	P-1099	P-0109	P-3009	P-1299
● Biocompatible Piston Seal Kit, Organic, ea	—	P-1099B	P-0109B	—	—
Check valve SS (inlet & outlet)	P-1085-2	P-1085	P-1085-2	P-1085	P-1085-2
Check valve PEEK kit (inlet & outlet)	P-1086	P-1086	P-1086	P-1086	P-1086
Replacement capsules, SS (10/pk)	P-1075	P-1075	P-1075	P-1075	P-1075
Replacement capsules, PEEK (10/pk)	P-1076	P-1076	P-1076	P-1076	P-1076
Self flush check valve kit	P-1084	P-1084	—	P-1084	—
Self flush assembly, SS	—	—	P-1082	—	P-1081
Self flush assembly PEEK	—	—	P-1088	—	P-1089
Inlet filter assy (fitting & element)	06-0110	06-0110	06-0110	06-0110	06-0110
Inlet filter element, 20 µm (2/pk)	P-1170	P-1170	P-1170	P-1170	P-1170
Replacement outlet filter element, SS (2/pk)	P-1175	P-1175	P-1175	P-1172	P-1172
Replacement outlet filter elements for PEEK Pumps, ea	P-1171	P-1171	P-1171	P-1171	P-1171
Prime purge valve rebuild kit, SS	P-1177	P-1177	P-1177	P-1177	P-1177
Prime purge valve rebuild kit, PEEK	P-1178	P-1178	P-1178	P-1178	P-1178
Prime purge valve assy, SS, ea	22-0292	22-0292	22-0292	22-0292	22-0292
Prime purge valve assy, PEEK, ea	06-0115	06-0115	06-0115	06-0115	06-0115
Pulse dampener w/transducer, SS—for models with real time pressure monitoring	P-1061	P-1061	P-1061	P-1061	P-1061
Pulse dampener w/transducer, PEEK—for models with real time pressure monitoring	P-1062	P-1062	P-1062	P-1062	P-1062
Pulse dampener (no transducer), SS	—	P-1065	P-1065	P-1065	—
Pulse dampener (no transducer), PEEK	—	P-1066	P-1066	P-1066	—
Pulse dampener rebuild kit	P-1063	P-1063	P-1063	P-1063	P-1063

*Seal kits include: Self flush seal, O-ring, primary seal, removal tool

TECH TIP | Seal Options

Standard Seals—Ultra High Molecular Weight Polyethylene

Organic seals—Graphite-filled PTFE for use with harsh chemicals

NEW! **Biocompatible Seal Option**
Now offering biocompatible seals which contain a fluoropolymer energizer (vs the Stainless Steel Energizer)

Alltech Pump Replacement Parts

ALLTECH PUMP REPLACEMENT PARTS					
ALLTECH PUMP MODELS	ALLTECH PART NO	CHROM TECH NEXT GEN REPL PUMP	SEAL KIT	CHECK VALVE KIT	PISTON
Alltech 301 SS Pump, 10 mL/min	301250	P-LS10S	P-1095	P-1085	P-1097
Alltech 301 SS Pump, 40 mL/min		P-LS40S	P-1096	P-1085	P-1198
Alltech 301 PEEK Pump, 10 mL/min	301150	P-LS10B	● P-1095B	P-1086	P-1097
Alltech 301 PEEK Pump, 40 mL/min		P-LS40B	● P-1096B	P-1086	P-1198
Alltech 426 SS Pump, 10 mL/min	426250	P-LST10S	P-1095	P-1085	P-1097
Alltech 426 SS Pump, 40 mL/min		P-LST40S	P-1096	P-1085	P-1198
Alltech 426 PEEK Pump, 10 mL/min	426150	P-LST10B	● P-1095B	P-1086	P-1097
Alltech 426 PEEK Pump, 40 mL/min		P-LST40B	● P-1096B	P-1086	P-1198
Alltech 626 SS Pump, 12 mL/min	626450	P-LD12S	P-1595	P-1085 (single cap) P-1085-2 (double cap)	P-1597
Alltech 626 PEEK Pump, 12 mL/min	626350	P-LD12B	● P-1595B	P-1086	P-1597
Alltech 627 SS Pump, 100 mL/min	627450	P-PR100S	P-1096	P-1085	P-1198
Alltech 627 PEEK Pump, 100 mL/min	627350	P-PR100B	● P-1096B	P-1086	P-1198

Check Valves



NEW! *Biocompatible Seals*
Now offering biocompatible seals which contain a fluoropolymer energizer (vs the Stainless Steel Energizer)

Filter Elements



Prime Purge Valve Rebuild Kits



Other Chrom Tech Pump Supplies

MISCELLANEOUS SUPPLIES FOR CHROM TECH PUMPS	
PART NO	DESCRIPTION
REPLACEMENT LOW PRESSURE INLET TUBING & FITTINGS	
T-10201	1/8" OD FEP Fluoropolymer tubing, 1/16" ID, 10' length
XP-301	1/4-28 Flat-Bottom Delrin Nut & ETFE Ferrule (P-300), for 1/8" OD tubing, ea
HIGH PRESSURE OUTLET TUBING & FITTINGS FOR 1/16" OD TUBING	
1531	1/16" OD PEEK tubing, 0.010" ID, 5' length
U-106	1/16" OD SS tubing, 0.010" ID, 5' length
U-400	10-32, SS Nut for 1/16" OD Tubing, ea
U-401X	SS Ferrule for 1/16" OD Tubing, 10/pk
6000-054	10-32, PEEK Nut for 1/16" OD Tubing, ea
6000-051	SS Ferrule for 1/16" OD Tubing, 10/pk



Agilent 1260 Infinity Isocratic LC Supplies

AGILENT 1260 INFINITY ISOCRATIC LC SUPPLIES

PART NO	DESCRIPTION
PUMP SUPPLIES	
G1312-60071	Purge Valve Long with PTFE Frit
01018-22707	PTFE frits, 5/pk
G1312-60066	Passive inlet valve
G1312-60020	Cartridge for active inlet valve, 600 bar
G1312-60067	Valve, outlet, 600 bar
5067-4728	Seal cap
5063-6586	Sapphire piston
5063-6589	Pump seal (reversed-phase) 2/pk
0905-1175	Wash seal (reversed-phase)
5001-3743	Seal keeper
5062-2484	Wash seal gasket, 6/pk
9301-6524	Ergonomic solvent reservoir, 1 L
9301-6526	Ergonomic solvent reservoir, amber, 1 L
G1311-60003	Bottle head assembly
5041-2168	Glass filter, solvent inlet, 20 µm pore size
5062-8517	Frit adaptor, PTFE, 3 mm, 4/pk
5043-1217	A-Line Stay Safe cap (GL45), 1-port for 3.2 mm OD tubing. Includes vent valve with time strip.
AUTOSAMPLER SUPPLIES	
01078-87302	100 µL loop for G1329A/B
0101-1416	Rotor seal for injection valve (two position/six port 600 bar)
0101-1417	Stator for injection valve (two position/six port 600 bar)
G1313-87201	Needle assembly for G1329B
G1329-87017	Standard needle seat, PEEK 0.17 mm ID capillary, 2.3 µL
AGILENT TUBING, CONNECTIONS, & TOOLS	
5065-9939	Capillary/fitting starter kit, 0.17 mm ID
0890-1763	Tubing, PEEK, 1.6 mm OD 0.18 mm ID 1.5 m
G1312-87303	SS capillary, 400 x 0.17 mm, m/m, ps/ps
G1313-87301	Capillary to metering device
5021-1816	Tubing, stainless steel, 0.17 mm ID, 105 mm, no fittings
5021-1817	Tubing, stainless steel, 0.17 mm ID, 150 mm, no fittings
5065-9931	Tubing, stainless steel, 0.17 mm ID, 200 mm, no fittings
5021-1818	Tubing, stainless steel, 0.17 mm ID, 280 mm, no fittings
5021-1819	Tubing, stainless steel, 0.17 mm ID, 400 mm, no fittings
5022-2184	Union, zero-dead-volume, stainless steel, no fittings
5062-2418	Front and back ferrules, 1/16" SS fitting, 10/pk
5063-6591	Finger-tight PEEK fittings, 1/16", 10/pk
5065-4426	Finger-tight PEEK fittings, 1/16" mixed colors, 10/pk
8710-1930	Tubing cutter, for plastic or PEEK tubing
8710-2391	Rheotool socket wrench, 1/4"
8710-2474	Multifunction tool
AGILENT VIALS & CLOSURES	
5182-0716	Vial, screw top, amber with write-on spot, 2 mL, certified, 100/pk
5183-2069	Vial, screw top, amber with write-on spot, 2 mL, certified, 1,000/pk
5183-2067	Vial, screw top, clear, 2 mL, certified, 1,000/pk
5190-1599	Cap, screw, blue, certified, PTFE/red silicone septum, 1,000/pk
5182-0717	Cap, screw, blue, PTFE/red silicone septum, 100/pk
5182-0721	Cap, screw, green, PTFE/white silicone septum, 100/pk



9301-6524
The new bottles feature an ergonomic design with a slimmer profile and ergonomically shaped gripping zones on both sides of the bottle, promoting easier and safer usage.



5062-8517



5041-2168



5043-1217
(includes time strip)



0101-1417

TECH TIP

The capillary/fitting starter kit includes stainless steel capillaries (4 x 105 mm, 4 x 150 mm, 2 x 180 mm, 1 x 400 mm, 10 x 1/16" stainless steel fittings and ferrule, 10 x 1/16" PEEK finger-tight fittings, 10 x 1/16" colored PEEK fittings, 5' 1/16" PEEK tubing, (3) stainless steel unions, plastic tubing cutter, 1/4" Rheotool socket wrench, & multifunction tool



5182-0716/
5182-2069



5182-0717

Agilent Purge Valves

AGILENT PURGE VALVES		
PART NO	DESCRIPTION	COMMENTS
G1312-60071	Purge valve, long, with PTFE Frit	For G1310, G1311, G1312, G1376, G2226
G4280-60031	Purge valve with PTFE frit	For 1120
G7111-60061	Purge valve, short, with PTFE frit	For 1120, 1220, G7110, G7111 pumps
01018-22707	PTFE frit	For G1310A, G1311A, G1312A, G1376A, G2226A, 1120, 1220, G1310B, G1311B, G1312B, G1311C, G1312C, G4202A
5067-4728	Seal cap	Not suitable for outlet ball valves w/integrated seal
G5611-60062	Bio-inert purge valve, long	For 1260 bio-inert systems, G5611A
5068-0005	5 position / 7 port rotor seal	For G4220A, G4220B
5068-0004	5 position / 7 port stator	For G4220A, G4220B
5067-4174	Multi purpose valve head	For G4204A
5068-0001	Stator 8pos/9port 1200 bar	For G4204A
5068-0123	Rotor for 5067-4174 multi purpose valve head	G4204A
5022-2192	Stainless steel filter assembly with PEEK ring, 2 µm pore size	For G1361A
8710-1924	Open end wrench, 14 mm	To remove purge valve



G1312-60071



01018-22707

Agilent Inlet and Outlet Valves

AGILENT INLET & OUTLET VALVES		
PART NO	DESCRIPTION	COMMENTS
INLET VALVES		
G1312-60025	Active inlet valve without cartridge	For G1310A, G1311A, G1312A, G1376A, G2226A, G1312B, G1312C
5062-8562	Cartridge for active inlet valve 400 bar	For G1310A, G1311A, G1312A, G1376A, G2226A, G1312C
G1312-60020	Cartridge for active inlet valve 600 bar	For G1312B
G5611-60025	Bio-inert active inlet valve	For G5611A
G5611-60020	Bio-inert cartridge for active inlet valve, 600 bar	For G5611A
G4204-60022 ¹	Inlet valve for 1290 quaternary pump	For G4204A
G1361-60012	Valve assemblies (inlet/outlet) for prep pumps	For G1361A
G1312-60066*	Passive inlet valve	For G1310B, G1311B, G1311C, 1120, 1220, G4302A
G4220-60022*	Passive inlet valve	For G4220A, G4220B
5067-4728	Seal cap	Not suitable for outlet ball valves w/integrated seal
OUTLET VALVES		
G1312-60067 ²	Outlet ball valve	For G1310A, G1311A, G1312A, G1376A, G2226A, 1120, 1220, G1310B, G1311B, G1311C, G1312B, G1312C, G4302A
G4220-60028 ²	Outlet ball valve	For G4220A, G4220B, G4204A
G5611-60067 ²	Bio-inert outlet ball valve	For G5611A
G1361-60012	Valve assemblies (inlet/outlet) for prep pumps	For G1361A
5067-4728	Seal cap	Not suitable for outlet ball valves w/integrated seal

1) Inlet valve with integrated seal 2) Outlet ball valve with integrated seal



G1312-60025



5062-8562



G1312-60066



5067-4728



G1312-60067



G4220-60028

Agilent Pistons & Seals

AGILENT PISTONS & SEALS		
PART NO	DESCRIPTION	COMMENTS
PISTONS		
5067-4695	Sapphire plunger	For G5611A, 4302A
5063-6586	Sapphire plunger	For G1310A, G1311A, G1312A, G1376A, G2226A, 1120, 1220, G1310B, G1311B, G1312B, G1311C, G1312C
G1361-22402	Sapphire plunger	For G1361A
SEALS		
G5611-21503	Bio-inert piston seal	For G5611A
0905-1719	Piston seal polyethylene	For G4220A, G4220B, G4204A
5063-6589	Piston seal graphite filled PTFE (reversed-phase) (2/pk)	For G1310A, G1311A, G1312A, G1376A, G2226A, 1120, 1220, G1310B, G1311B, G1312B, G1311C, G1312C, G4302A
0905-1420	Piston seal Polyethylene (normal phase)	For G1310A, G1311A, G1312A, G1376A, G2226A, 1120, 1220, G1310B, G1311B, G1312B, G1311C, G1312C, G4302A
5022-2188	Piston seal	For G1361A
SPECIFIC PARTS FOR 1290 INFINITY LC PUMPS		
G4220-60006	Jet Weaver 35 µL/100 µL	For G4220A, G4220B, G4204A
G4220-60012	Jet Weaver 380 µL	For G4220A, G4220B, G4204A
G4204-40000	Clamp for in-line filter	For G4204A
G4204-60004	Outlet filter 1290 quaternary pump	For G4204A
5067-6189	0.3 µm in-line filter	
5023-0271	0.3 µm replacement frit, 5/pk	For 5067-6189, 5067-4638
5067-4716	Outlet valve for flush pump	
5067-4661	Tubing kit 270 mm, 2/pk	
G4220-60035	Tubing kit 140 mm, 2/pk	
5067-4124	Shut-off valve	For G4220A, G4220B, G4204A
G4212-68001	Inline pressure relief valve kit	For G4220A, G4220B
5067-4697	Solvent selection valve bridge tube	
G4212-60022	Pressure relief valve	For G4220A, G4220B
G4204-40005	PEEK seal for inlet weaver assembly	For G4204A
G4220-60015	Seal holder integrated for 1290 pump	For G4220A, G4220B
G4220-60016	Seal holder integrated for 1290 pump	For G4220A, G4220B



Agilent Seal Wash

AGILENT SEAL WASH		
PART NO	DESCRIPTION	COMMENTS
5042-8507	Peristaltic pump cassette with silicone tubing	For 1100/1200/1200 RRLC and 1260
5065-9978	Silicone tubing, 1 mm ID, 3 mm OD, 5 m	
5065-9952	Peristaltic pump with ChemSure tubing	For 1100/1200/1200 RRLC and 1260
5042-8954	ChemSure tubing for peristaltic pump	
WASH SEAL AND WASH KEEPER		
0905-1175	Wash seal	For 1100/1200/1200 RRLC, 1120 and 1260/1220
5001-3743	Seal keeper	For 1100/1200/1200 RRLC and 1120
G5611-26210	Bio-inert seal keeper	For G5611A
5062-2484	Wash seal gasket, 6/pk	For 1100/1200/1200 RRLC, 1120 and 1260/1220
0905-1718	Wash seal PE	For 1290/1260/1220
G4220-63010	Support ring	For 1290/1260/1220
G4220-60015	Support ring integrated for 1290 pump	For 1290 without seal wash
G4220-60016	Seal holder integrated for 1290 pump	For 1290/1260/1220



Agilent Solvent Reservoirs

AGILENT SOLVENT RESERVOIRS	
PART NO	DESCRIPTION
9301-6342	2 L reservoir, clear
9301-6341	2 L reservoir, amber
NEW! ERGONOMIC SOLVENT RESERVOIRS	
9301-6527	125 mL reservoir, clear
9301-6523	500 mL reservoir, clear, with cap
9301-6525	500 mL reservoir, amber, with cap
9301-6524	1 L reservoir, clear
9301-6528	1 L reservoir, clear, with cap
9301-6526	1 L reservoir, amber
9301-6529	Identification Silicone ring (8/pk with 4 different colors)
9301-6530	Sticker for solvent bottles, 100/pk



The new bottles feature an ergonomic design with a slimmer profile and ergonomically shaped gripping zones on both sides of the bottle, promoting easier and safer usage.

Agilent Solvent Filters

If the filter is in good condition, the solvent will freely drip out of the solvent tube (hydrostatic pressure). If the solvent filter is partially blocked, only very little solvent will drip out of the solvent tube.

Caution: Small particles can permanently block the capillaries and valves of the module.

- ➔ Always filter solvents
- ➔ Never use the module without solvent inlet filter

5041-2168



Agilent Solvent Filters

AGILENT SOLVENT FILTERS						
DESCRIPTION	RECOMMENDED USE	SOLVENT FILTER	FRIT ADAPTER	FRIT INLET ID (mm)	TUBE OD (mm)	FRIT
Glass filter, solvent inlet, 20 µm pore size	Analytical scale, micro scale	5041-2168	Frit adapter, PTFE, 3 mm, 4/pk	5	3.2	5062-8517
Glass filter, solvent inlet, 40 µm pore size	Preparative LC	3150-0944	Frit adapter, PTFE for 4.7 mm OD	7	4.7	G1361-23205
Glass filter, solvent inlet, 40 µm pore size	Preparative LC	3150-0944	Frit adapter, PTFE, 4 mm	7	4	G1361-23204
Glass filter, solvent inlet, 40 µm pore size	For G2258A Dual Loop Autosampler	3150-0944	Frit adapter, PTFE for 3.2 mm OD	7	3.2	G2258-23201
Solvent inlet filter, stainless steel	Capillary and nano systems	01018-60025				

Agilent Frits & Adapters

AGILENT FRITS & ADAPTERS	
PART NO	DESCRIPTION
G1312-87330	Solvent mixer, 1100 Series
5067-1565	Solvent mixer, short, 200 µL
G1361-23205	Frit adapter, PTFE, for 4.7 mm OD tubing
G2258-23201	Frit adapter, PTFE, for 3.2 mm OD tubing, for G2258A Dual Loop Autosampler
0905-1516	O-ring, Viton, 30 mm
5022-2192	Stainless steel filter assembly with PEEK ring, 2 µm pore size

5062-8517



01018-60025



Agilent Miscellaneous Capillaries

MISCELLANEOUS CAPILLARIES (WITHOUT FITTING)						
PART NO	MATERIAL	ID (mm)	LENGTH (mm)	OD (mm) A*	OD (mm) B*	COLOR
5021-1820	SS	0.12	105	1/16"	1/16"	Red
5021-1821	SS	0.12	150	1/16"	1/16"	Red
5065-9935	SS	0.12	200	1/16"	1/16"	Red
5021-1822	SS	0.12	280	1/16"	1/16"	Red
5021-1823	SS	0.12	400	1/16"	1/16"	Red
5065-9964	SS	0.12	500	1/16"	1/16"	Red
5021-1816	SS	0.17	105	1/16"	1/16"	Green
5021-1817	SS	0.17	150	1/16"	1/16"	Green
5065-9931	SS	0.17	200	1/16"	1/16"	Green
5021-1818	SS	0.17	280	1/16"	1/16"	Green
5021-1819	SS	0.17	400	1/16"	1/16"	Green
5065-9933	SS	0.17	600	1/16"	1/16"	Green
5065-9932	SS	0.17	700	1/16"	1/16"	Green
5065-9963	SS	0.17	900	1/16"	1/16"	Green



(Shown with fitting—not included)

Agilent Vacuum Degassers

A vacuum degasser is recommended for:

- ➔ Maximum sensitivity in the low UV wavelength range
- ➔ High injection precision
- ➔ High retention time reproducibility
- ➔ Flow rates below 0.5 mL/min



1200 Series Vacuum Degasser

AGILENT VACUUM DEGASSERS		
PART NO	DESCRIPTION	COMMENTS
G1322-67300	Tubing kit, degasser to pump, 4/pk, 30 cm pieces of tubing with screws and bushings	For G1322A, G1379A/B
5067-5378	Inlet tubing	For Agilent 1260 Infinity Quaternary Pump VL
0100-1710	Mounting tool for flangeless nut	For G1322A, G1379A/B
8710-1930	Plastic tubing cutter	For G1322A, G1379A/B
5063-6598	Tefzel ferrules and SS lock rings, 1/8", 10/pk	For G1322A, G1379A/B
5063-6599	PPS nuts, 1/8", 1/4-28 thread, 10/pk	For G1322A, G1379A/B
5022-2155	Union, 1/4-28 thread, polypropylene	For G1322A, G1379A/B
5062-2483	PTFE solvent tubing, 5 m, 1.5 mm ID, 3 mm OD	For G1322A, G1379A/B
5190-5103	Disposable syringes, 20 mL, 100/pk	For G1322A
9301-1337	Syringe adapter, 1/16" OD, 2" long	For G1322A
G1379-67310	Micro vacuum degasser tubing kit	For G1379A
5042-8922	Micro vacuum degasser tubing kit	For G1379B
G1322-68705	Online degasser accessory kit, Includes 8 screws, 8 bushings, 4 markers, tubing, syringe and syringe adapter	For G1322A, G1379A/B
5067-4798	Vacuum chamber (2 channel)	For G1379A, G1379B
5067-5380	Tubing kit for 5067-4798 vacuum chamber	For G1379A, G1379B
5067-5383	Vacuum chamber replacement kit Includes two 5067-4798 and one 5067-5380	For G1379A, G1379B



0100-1710

8710-1930

5063-6598

5063-6599

TECH TIP | Vacuum Degasser Care

- ➔ To generally clean the vacuum degasser tubing, flush the system with isopropanol
- ➔ Flush the degasser with water after using buffers
- ➔ Speed solvent changes by drawing solvent through the degasser and tubing with syringe adapter kit

Agilent Injection Valves

AGILENT INJECTION VALVES							
VALVE DESCRIPTION	USE WITH	VALVE	RHEBUILD KIT	ROTOR SEAL MATERIAL	ROTOR SEAL	STATOR	STATOR FACE
2 position/6 port injection valve, 400 bar	G1313A, G1329A, G1367A/B, 1120	0101-0921	0101-1257	Vespel	0100-1853	0100-1850	0100-1851
				Tefzel	0100-1849		
				PEEK	0100-2231		
2 position/6 port micro injection valve, 400 bar	G1377A, G1389A	0101-1050	—	Vespel	0100-2088	0100-2089	—
2 position/6 port injection valve, 600 bar	G1329B, G1367C SL, G1367D SL Plus, G1367E, 1220 Infinity LC	0101-1422	—	PEEK	0101-1416	0101-1417	—
2 position/6 port MBB injection valve, 400 bar	G2260A	—	0101-1268	Peek	0101-1268*	0100-2195	—
2 position/6 port ultra high pressure valve, 1200 bar	G4226A	—	—	Vespel	5068-0007	5068-0006	—

*Includes seal and stator face



Agilent Needles & Needle Seats

The needle should be replaced when it becomes bent, burred or blunt, or when it is leaking or plugged. You should suspect a leak if you notice a trail of buffer crystals on the needle seat. The needle seat can become blocked if the sample contains particulates, as this is the first restriction that the sample experiences. If this occurs, try backflushing the needle seat capillary.

AGILENT NEEDLES AND NEEDLE SEATS				
AGILENT AUTOSAMPLER	NEEDLE ASSEMBLY DESCRIPTION	PART NO	COMPATIBLE WITH NEEDLE SEAT	PART NO
G1313A, G1329A/B, 1120, 1220 Infinity LC (automated sampler only)	Standard autosampler	G1313-87201	Standard, PEEK 0.17 mm ID capillary, 2.3 µL	G1329-87017
			Standard, PEEK 0.12 mm ID capillary, 1.2 µL	G1329-87012
G1313A, G1329A, 1120, 1220 Infinity LC (automated sampler only)	For use with PEEK seat	G1313-87203	Standard, PEEK 0.17 mm ID capillary, 2.3 µL	G1313-87102
G1313A, G1329A/B, 1120, 1220 Infinity LC (automated sampler only)	900 µL upgrade	G1313-87202	Standard, 0.17 mm ID capillary, 2.3 µL	G1329-87017
G1389A	Micro LC autosampler	G1329-80001	Micro LC, 100 µm ID capillary, 1.2 µL	G1329-87101
			Micro LC, 50 µm ID capillary, 0.3 µL	G1329-87103
G1367A/B	Well plate autosampler (green)	G1367-87200	Vespel, well plate autosampler 0.17 mm ID capillary, 2.3 µL	G1367-87101
	Well plate autosampler (blue)	G1367-87201	Vespel, well plate autosampler 0.12 mm ID capillary, 1.2 µL	G1367-87102
G1367C SL and G1367D SL Plus	Well plate autosampler (black)	G1367-87202	600 bar, w/seat capillary 0.17 mm ID x 100 mm, 0.8 mm OD	G1367-87017
			PEEK 600 bar, w/seat capillary 0.12 mm ID x 100 mm, 0.8 mm OD	G1367-87012
G1367E	1290/1260 Infinity LC autosampler	G4226-87201	PEEK 600 bar, w/seat capillary 0.12 mm ID x 100 mm, 0.8 mm OD	G1367-87012
G1377A	Micro well plate sampler	G1377-87201	Micro w/seat capillary, 100 µm	G1377-87000
			Micro w/seat capillary, 75 µm	G1377-87001
			Micro w/seat capillary, 50 µm	G1377-87002
G2258A	Dual loop autosampler	G2258-68710	Twin, dual loop autosampler	G2258-87102
G2260A	Prep autosampler	G2260-87201	Prep autosampler, 0.5 mm ID, 20 µL	G2260-87101
G4226A	1290/1260 Infinity LC autosampler	G4226-87201	Seat assembly, Vespel 0.12 mm, 1290 Infinity LC autosampler	G4226-87012
G4226A	1290/1260 Infinity LC autosampler	G4226-87201	Ultra low dispersion	G4226-87030
G5667A	Bio-inert needle, 600 bar	G5667-87200	Bio-inert assembly, 600 bar	G5667-81008



ACCESSORIES		
PART NO	DESCRIPTION	USE WITH
G1313-43204	Seat adapter	G1313A, G1329A, G1389A, G2260A, 1120 and 1220 Infinity LC
5063-6506	Finger caps, for Autosampler Gripper, 15/pk	G1313A, G1329A, G1389A, G2260A, 1120 and 1220 Infinity LC
G1377-44900	Tool for micro seat capillary mounting	G1377A

Agilent Metering Device Supplies

Infrequently, the metering device seal and piston may need replacement if you see loss in injection volume precision or metering device leaking.

AGILENT METERING DEVICE SUPPLIES				
PISTON DESCRIPTION	USE WITH	PISTON	SEAL DESCRIPTION	SEAL
Sapphire piston, 40 µL	G1367D, G1389A, G1377A, G4226A	5064-8293	Piston seal, 2 mm, for G1367D, G1389A, G1377A	5022-2175
			Piston seal for G4226A	0905-1717
Sapphire plunger, 100 µL	G1313A, G1329A/B, G1367A/B/C, G1367E	5063-6586	Piston seal graphite filled PTFE (reversed-phase), 2/pk	5063-6589
Sapphire plunger, 100 µL	G5667A	5067-4695	Bio-inert piston seal	G5611-21503
Sapphire piston, 900 µL	G1313A, G1329A/B, G1367E	5062-8587	Metering valve seal	0905-1294
Piston, 5 mL	G2258A	G2258-60003	Piston seal	0905-1599

Agilent Loop Capillaries

AGILENT LOOP CAPILLARIES		
DESCRIPTION	AGILENT AUTOSAMPLER	PART NO
PEEK, SS Clad, Bioinert, 100 µL	G5667A	G5667-81006
Stainless steel loop capillary, 100 µL	G1313A	01078-87302
	G1329A/B	
	1120	
	1220 Infinity LC	
	G1367A/B/C	G1367-87300
Stainless steel loop capillary, 900 µL	G4226A	5067-4710
	G1367E	
	G1329A/B	G1313-87303
Loop capillary, 40 µL	G2260A	
	G1367D	G1377-87310
	G4226A	5067-4703
	G1367E	
	G1377A	G1377-87300
Loop capillary, 20 µL	G1389A	G1329-87302
	G4226A	G4226-60310
	G1367E	
Loop capillary, 8 µL	G1389A	G1375-87303
	G1377A	G1375-87315
Loop capillary, 5 µL	G2260A	G2260-68711

5063-6589



01078-87302



G4226-60310



Agilent Autosampler Trays

AGILENT AUTOSAMPLER TRAYS	
PART NO	DESCRIPTION
FOR G1313A, G1329A/B, 1120, 1220 INFINITY LC SAMPLERS	
G1313-44510	100 position tray for 2 mL vials
G1329-60011	100 position tray for 2 mL vials, thermostatable
G1313-44512	40 position tray for 2 mL vials
G1313-44513	15 position tray for 6 mL vials
G1313-60004	External vial tray for 17 vials (disposal position)
G1313-27302	Disposal tube for external vial tray
FOR G1367A/B/C/D/E, G2258A, G4226A	
G2258-60011	Well plate tray, 2 well plates, 10 vials (supports 50 mm plates)
G2255-68700	Vial plate for 54 x 2 mL vials, 6/pk
5022-6539	Vial plate for 15 x 6 mL vials
FOR G1367A/B/C/D/E	
G4226-60021	100 position tray for micro vials Also for G4226A
5022-6538	Plate for 27 Eppendorf Safe-lock tubes, 0.5/1.5/2mL

G2555-68700



5022-6539



5022-6538



CHROM TECH RELATED PRODUCTS



Agilent Certified Vials, page 18

NEW! Safer Agilent Laboratory Solvent Bottles

AGILENT SOLVENT BOTTLES	
PART NO	DESCRIPTION
9301-6527	Solvent bottle, clear, 125 mL
9301-6523	Solvent bottle, clear, 500 mL with cap
9301-6525	Solvent bottle, amber, 500 mL with cap
9301-6524	Solvent bottle, clear, 1000 mL
9301-6528	Solvent bottle, clear, 1000 mL with cap
9301-6526	Solvent bottle, amber, 1000 mL
9301-6529	Identification Silicone ring (8/pk with 4 different colors)
9301-6530	Sticker for solvent bottles, 100/pk



The new bottles feature an ergonomic design with a slimmer profile and ergonomically shaped gripping zones on both sides of the bottle, promoting easier and safer usage.

Agilent Fraction Collector Supplies

Agilent fraction collectors are designed to process data in real-time for instantaneous and precise fraction collection, while increasing throughput on your purification system. So you can be certain that you are getting the highest degree of recovery and purity for your fractions – even with low flow rates.

Agilent Collecting Tubes & Trays

AGILENT COLLECTING TUBES & TRAYS					
TRAY	HOLE DIAMETER (mm)	NO OF TUBES	TUBE DIMENSIONS	TUBE	QTY
G1364-84523	30	40	30 x 100mm	5042-6458	100/pk
			30 x 48 mm	5042-6470	100/pk
G1364-84524	25	60	25 x 100 mm	5042-6459	100/pk
G1364-84525	16	126	16 x 100 mm	5022-6532	250/pk
			16 x 48 mm	5022-6533	100/pk
G1364-84516	12	215	12 x 100 mm	5022-6531	250/pk
			12 x 48 mm	5022-6534	100/pk
G1364-84532	Funnel tray	40	Any size	—	—

G1364-84532



Agilent Well Plate Trays

AGILENT WELL PLATE TRAYS				
TRAY	DESCRIPTION	WELL PLATE	DESCRIPTION	UNIT
G1364-84521	Tray for 4 well plates, cooled	5042-1385	96-well plates, 0.5 mL, polypropylene	120/pk
		5042-1386	96-well plates, 0.5 mL, polypropylene	10/pk
G1364-84531	Tray for 4 well plates, adjustable, cooled	5042-6454	96-deep well plates, 1 mL, polypropylene	50/pk
		5042-1389	Closing mats for 96-well plates, silicone, pre-slit, fits 96-well plates P/N 5042-1385 and 5042-1386 only	50/pk
G1364-84522	Tray for 2 well plates, 10 funnels, cooled	5042-1388	384-well plates, 90 µL, polypropylene	30/pk
		5065-4402	96-deep well collection plates with glass inserts, caps, and septa, pre-assembled, 0.35 mL	
—	Tray for 2 well plates, 10 vials, 2 mL	5188-5321	Glass inserts, 350 µL	1000/pk
		5188-5322	Caps/septa for glass inserts	1000/pk
		5042-8502	96-well plates, 150 µL, conical, polypropylene	25/pk
		G2255-68700	Vial plate for 54 x 2 mL vials	6/pk
		5022-6538	Plate for 27 Eppendorf Safe-lock tubes, 0.5/1.5/2 mL	
		5022-6539	Vial plate for 15 x 6 mL vials	

5042-1389



G2255-68700



5022-6538



Agilent Fraction Collector Capillary Kits & Needles

AGILENT FRACTION COLLECTOR CAPILLARY KITS AND NEEDLES						
MODULE	MAX FLOW RATE	TUBE SIZE	TUBING KIT	NEEDLE LENGTH	NEEDLE	TYPICAL USE
G1364B	100 mL/min	0.8 mm ID	G1364-68711		G1364-87201	Tubes (max 100 mm)
G1364C	1 mL/min	0.15 mm ID	G1364-68723	50 mm	G1367-87200	Tubes (max 48 mm), well plates, vials
				10 mL/min	0.25 mm ID	G1364-68712
	10 mL/min	0.25 mm ID	G1364-68712	20 mm	G1364-87202	Funnel tray (tubes max 75 mm)
	100 mL/min	0.8 mm ID	G1364-68711	20 mm	G1364-87202	
G1364D	4 µL/min	25 µm ID	G1364-87304		—	MALDI targets, well plates
	4-30 µL/min	50 µm ID	G1364-87305		—	
	30-100 µL/min	100 µm ID	G1364-87306		—	

5022-6539



Agilent Manual Injection Valves with Position Sensing Switches



Agilent Manual Injection Valve Replacement Parts

- ➔ Rotor seals wear with use and need routine replacement
- ➔ Stators only need replacement if the ports are damaged
- ➔ PEEK rotor seals are incompatible with concentrated nitric and sulfuric acids

AGILENT MANUAL INJECTION VALVES WITH POSITION SENSING SWITCHES										
PART NO	DESCRIPTION	COMMENTS	ROTOR SEAL MATERIAL	ROTOR SEAL	STATOR FACE	STATOR HEAD	BEARING RING	ISOLATION SEAL	REPAIR KIT	NEEDLE PORT ADAPTER
5063-6502	2 position/ 6 port valve, 400 bar, for G1328A/B	Analytical	Tefzel	0101-0620	0100-1859	0100-1860	1535-4045	1535-4046	0101-1254	—
			Vespel	0101-0623						
			PEEK	0101-1255						
5067-4191	Manual FL-Injection Valve, 600bar	Analytical	PEEK	5068-0052	—	5068-0053	1535-4045	1535-4046	—	—
5067-4202	2 position/ 6 port, 600 bar, for 1220	Analytical	PEEK	0101-1409	—	0101-1417	1535-4045	—	—	5067-1581
5067-4158	2 position/ 6 port valve, 600 bar, for Bio-inert	Bio	PEEK	5068-0082	0100-1851	5068-0060	1535-4045	—	—	5067-1581
0101-1253	2 position/ 6 port valve, 400 bar PEEK	Analytical	Tefzel	0101-0620	0100-1859	—	—	1535-4046	—	—
0101-1232	Prep. SST 400 bar, for 3725i	Preparative	PEEK	0101-1233	—	—	—	1535-4046	—	—
0101-1231	Manual prep injection valve, PEEK	Preparative	PEEK	0101-1233	—	—	—	1535-4046	—	—

See Sample Loops (Page 271)

Agilent Thermostatted Column Compartment Supplies

AGILENT THERMOSTATTED COLUMN COMPARTMENT SUPPLIES	
PART NO	DESCRIPTION
5065-9947	RapID Resolution High Throughput capillary kit Used for converting an Agilent 1200 instrument to the RRLC configuration, to enable use of high efficiency columns (to 600 bar). Can also be used for Agilent 1100 instruments.
G1316-68716	1200 capillary kit for 0.12 mm ID
G1316-80022	Low dispersion heat exchanger, double, 1.6 µL, for G1316C
G1316-80002	High temperature heat exchanger, 1.6 µL, 0.12 mm ID, "R"
G1316-80003	High temperature heat exchanger, 1.6 µL, 0.12 mm ID, "L"
G1316-80004	Heat exchanger/cooler, 1.5 µL, 0.12 mm ID
G1316-83200	Carrier for heat exchanger 1290 Infinity TCC and 1200 Series TCC SL
5062-8588	Column Identification Module (CIM), 3/pk
5063-6526	Column clamp, 6/pk
5001-3702	Column holder for micro LC columns
G7116-68003	Column holder clips (lamella type), 2/pk
G1316-87303	Column connecting capillary with fittings, 7 cm, 0.12 mm ID, 1/16" male/male
G1316-87300	Column connecting capillary with fittings, 9 cm, 0.17 mm ID, 1/16" male/male
G1313-87304	Column connecting capillary with fittings, 18 cm, 0.12 mm ID, 1/16" male/male
G1313-87305	Column connecting capillary with fittings, 18 cm, 0.17 mm ID, 1/16" male/male
5022-6503	PEEK tubing, 1/32" OD, 0.4 mm ID, 450 mm, Micro valve to waste
G1316-60001	Thermal column insulation enclosure kit



G1316-80022



G1316-80002



G1316-80004



5062-8588

Agilent Detector Supplies

Agilent wavelength detectors combine exceptional flexibility with superior instrument control, data communication, and analytical capabilities. This section shows you how to maintain your detector's high level of selectivity and sensitivity.

DETECTOR MAINTENANCE TIPS

SYMPTOM	WHAT TO DO	ADDITIONAL INFORMATION
Lamp does not ignite	Exchange the lamp	Perform a wavelength calibration test and an intensity test after lamp replacement
Noise exceeds application limit	Exchange the flow cell	Perform a wavelength calibration test after flow cell replacement
Drift exceeds application limit	Exchange the lamp	Perform a wavelength calibration test and a pressure tightness test after flow cell replacement
Leaky flow cell (For G4212 only)	Exchange the flow cell	Perform a wavelength calibration test after flow cell replacement
Leaky flow cell (For all G1314/G1315/G1365 detectors)	Clean or exchange the flow cell	Perform a wavelength calibration test and a pressure tightness test after flow cell replacement
Lower intensity (For G4212 only)	Exchange the flow cell	Perform a wavelength calibration test after flow cell replacement
Lower intensity (For all G1314/G1315/G1365 detectors)	Clean or exchange the flow cell	Perform a wavelength calibration test and a pressure tightness test after flow cell replacement

Agilent Certified Lamps

- ➔ All lamps are tested for noise and drift specifications, correct operating voltage, light intensity and proper alignment
- ➔ Improved coating process increases Agilent lamp lifetimes up to 50%
- ➔ Agilent deuterium lamps are designed with a much narrower aperture providing increased light intensity and decreased noise – translating into an appreciably higher signal-to-noise ratio
- ➔ By providing higher sensitivity, Agilent lamps can extend detection capabilities and improve qualification trace levels—for more than 2,000 hours of use

Agilent's lamps are manufactured in an ISO9001 certified environment and are fully traceable throughout every step of the production process. Each lamp is then tested to ensure it meets Agilent's performance specifications. Test equipment is regularly calibrated using optical standards certified by NIST (National Institute of Standards and Technology) or PTB (Physikalisch-Technische Bundesanstalt).

AGILENT DETECTOR LAMPS

PART NO	DESCRIPTION	COMMENTS
VARIABLE WAVELENGTH DETECTOR (VWD)		
G1314-60101	Long life Deuterium lamp with RFID tag	For G1314D/E/F and G7114A/B
G1314-60100	Long life Deuterium lamp	For G1314A/B/C, 1120 and 1220 Infinity LC
DIODE ARRAY DETECTOR (DAD)/MULTIPLE WAVELENGTH DETECTOR (MWD)		
5190-0917	Long life HiS Deuterium lamp (8-pin) with RFID tag	For G4212A/B and G7117A/B/C
2140-0820	Long life Deuterium lamp with RFID tag	For G1315C/D, G1365C/D, G7115A and G7165A 1220 LC with DAD
2140-0813	Long life Deuterium lamp	For G1315A/B and G1365A/B
5182-1530	Long life Deuterium lamp	For G1315A/B and G1365A/B
2140-0590*	Deuterium lamp	For G1315A/B and G1365A/B
G1103-60001	Tungsten lamp	For G1315A/B/C/D and G1365A/B/C/D

*Standard lamp for 1000 hours of use only



G1314-60100



5190-0917



2140-0813



5182-1530



2140-0590

Agilent Variable Wavelength Detector (VWD) Supplies

AGILENT VWD FLOW CELL SELECTION						
TYPICAL COLUMN LENGTH (cm)	TYPICAL PEAK WIDTH	RECOMMENDED FLOW CELL				
< = 5	0.025	Micro Flow Cell			High Pressure Flow Cell For Pressure Above 100 bar	
10	0.05	0.05-0.2 mL/min	Semi-micro Flow Cell			
20	0.1		Standard Flow Cell			
> = 40	0.2					
Typical Flow Rate		0.05-0.2 mL/min	0.2-0.4 mL/min	0.4-0.8 mL/min	1-2 mL/min	0.05-5 mL/min
Internal Column Diameter		1.0 mm	2.1	3.0	4.6	

Agilent Flow Cell and Repair Kits for VWD

AGILENT FLOW CELL AND REPAIR KITS FOR VWD				
PART NO	DESCRIPTION	USE WITH	SPECIFICATIONS	REPAIR KIT
G1314-60186	Standard flow cell, RFID	G1314D/E/F	10 mm, 14 µL, 40 bar	G1314-65061
G1314-60186	Standard "D" type flow cell	G1314A/B/C	10 mm, 14 µL, 40 bar	G1314-65061
G1314-60183	Semi-micro flow cell, RFID	G1314D/E/F	6 mm, 5 µL, 40 bar	G1315-68713
G1314-60183	Semi-micro flow cell	G1314A/B/C	6 mm, 5 µL, 40 bar	G1315-68713
G1314-60187	Micro flow cell, 3 mm, RFID	G1314D/E/F	2 µL, 120 bar	G1315-68713
G1314-60187	Micro flow cell, 3 mm	G1314A/B/C	2 µL, 120 bar	G1315-68713
G1314-60081	Micro flow cell, 5 mm	G1314A/B/C	1 µL, 40 bar	G1314-65052
G1314-60182	High pressure flow cell, RFID	G1314D/E/F	10 mm, 14 µL, 400 bar	G1314-65054
G1314-60182	High pressure flow cell	G1314A/B/C	10 mm, 14 µL, 400 bar	G1315-68713



Variable Wavelength Detector

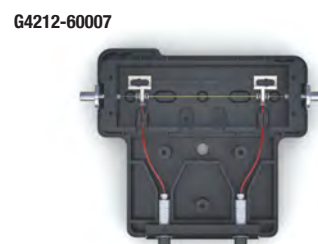
Agilent Capillaries for VWD

AGILENT CAPILLARIES FOR VWD FLOW CELL					
FLOW CELL DESCRIPTION	PART NO	INLET CAPELLARY	PART NO	OUTLET CAPELLARY	PART NO
Standard flow cell, RFID	G1314-60186	Inlet capillary, 0.17 mm ID, 600 mm long	5062-8522	Waste capillary, PEEK, 0.25 mm ID	5062-8535
Standard "D" type flow cell	G1314-60186			1/16" finger-tight PEEK fitting, 2/pk	0100-1516
Semi-micro flow cell, RFID	G1314-60183	Inlet capillary, 0.12 mm ID, 400 mm long	5021-1823	Waste capillary, PEEK, 0.25 mm ID	5062-8535
Semi-micro flow cell	G1314-60183			1/16" finger-tight PEEK fitting, 2/pk	0100-1516
Semi-micro flow cell 3 mm, RFID	G1314-60187	Inlet capillary, 0.12 mm ID, 310 mm long	G1314-87301	Outlet capillary, 0.17 mm ID, 120 mm long	G1314-87302
Semi-micro flow cell 3 mm	G1314-60187				
Semi-micro flow cell 5 mm	G1314-60081	Inlet capillary, 0.12 mm ID 400 mm long	5021-1823	Outlet capillary, 0.17 mm ID, 120 mm long	G1314-87302
High pressure flow cell, V WD, 10mm, 14ul, RFID	G1314-60182	Inlet capillary, 0.17 mm ID, 380 mm long	G1315-87311	Outlet capillary, 0.17 mm ID, 120 mm long	G1314-87302
High pressure flow cell, V WD, 10mm, 14ul, RFID	G1314-60182				

Agilent Diode Array Detector (DAD)/Multiple Wavelength Detector (MWD) Supplies

Agilent Flow Cell and Repair Kits for DAD/MWD

AGILENT FLOW CELL AND REPAIR KITS FOR DAD/MWD					
PART NO	DESCRIPTION	USE WITH	SPECIFICATION		REPAIR KIT
G1315-60022	Standard flow cell w/RFID tag	G1315C/D, G1365C/D	10 mm, 13 μ L, 120 bar		G1315-68712
G1315-60012	Standard flow cell	G1315A/B, G1365A/B	10 mm, 13 μ L, 120 bar		
G1315-60025	Semi-micro flow cell, RFID	G1315C/D, G1365C/D	6 mm, 5 μ L, 120 bar		G1315-68713
G1315-60011	Semi-micro flow cell	G1315A/B, G1365A/B	6 mm, 5 μ L, 120 bar		
G1315-60024	Micro flow cell, RFID	G1315C/D, G1365C/D	3 mm, 2 μ L, 120 bar		G1315-68713
G1315-60015	Micro high-pressure flow cell	G1315A/B, G1365A/B	6 mm, 1.7 μ L, 400 bar		—
G1315-68724	500 nL flow cell		10 mm, 50 bar		—
G1315-68716	80 nL flow cell		6 mm, 50 bar		—
G1315-60016	Preparative flow cell	G1315A/B, G1365A/B	3 mm, 120 bar, SS		G1315-68712
G1315-60017	Preparative flow cell		0.3 mm, 20 bar, quartz		—
G1315-60018	Preparative flow cell		0.06 mm, 20 bar, quartz		—
G4212-60008	Max-Light cartridge cell	G4212A/B Infinity LC DAD	10 mm, 1.0 μ L, 60 bar		—
G4212-60007	Max-Light cartridge cell	G4212A/B Infinity LC DAD	60 mm, 4.0 μ L, 60 bar		—
G4212-60011	Max-Light cartridge test cell	Must be used to perform detector build-in tests			—
G4212-60038	Max-Light ultra low dispersion flow cell	G4212A/B Infinity LC DAD	10 mm V(σ) = 0.6 μ L		—
G4212-60032	Max-Light High Dynamic Range (HDR) flow cell	G4212A/B Infinity LC DAD	3.7 mm, V(σ) = 0.9 μ L		—

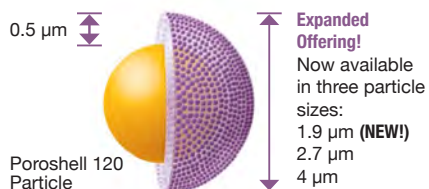


Agilent Capillaries for DAD/MWD

AGILENT CAPILLARIES FOR DAD/MWD FLOW CELL					
FLOW CELL DESCRIPTION	PART NO	INLET CAPILLARY	PART NO	OUTLET CAPILLARY	PART NO
Std flow cell w/RFID tag	G1315-60022	Inlet capillary w/heat exchanger, 0.17 mm ID, 590 mm long	G1315-87321	0.17 mm ID, 200 mm long	G1315-87302
Std flow cell	G1315-60012				
Semi-micro flow cell w/RFID tag	G1315-60025	DAD heat exchanger capillary, 0.17 mm ID, 310 mm long	G1315-87319	0.12 mm ID, 200 mm long	G1315-87306
Semi-micro flow cell	G1315-60011			0.17 mm ID, 200 mm long	G1315-87302
				0.12 mm ID, 200 mm long	G1315-87306
				0.17 mm ID, 200 mm long	G1315-87302
Micro flow cell w/RFID tag	G1315-60024	DAD heat exchanger capillary, 0.12 mm ID, 310 mm long	G1315-87339	0.12 mm ID, 200 mm long	G1315-87306
				0.17 mm ID, 200 mm long	G1315-87302
Micro high-pressure flow cell	G1315-60015	Inlet capillary w/heat exchanger, 0.12 mm ID, 290 mm long	G1315-87325	0.12 mm ID, 200 mm long	G1315-87306



CHROM TECH RELATED PRODUCTS



Agilent InfinityLab Poroshell 120 LC Columns, page 60



Chrom Tech Solvent Waste Container Kit, page 262

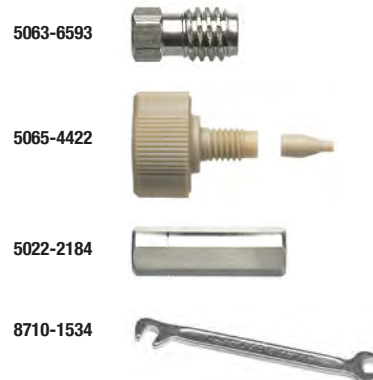


Agilent Certified Vials, page 18

Agilent Diode Array Detector (DAD)/Multiple Wavelength Detector (MWD) Supplies

Agilent 80 nL & 500 nL Flow Cell Supplies

AGILENT 80 nL AND 500 nL FLOW CELL SUPPLIES		
PART NO	DESCRIPTION	QTY
5063-6593	Fitting screw	10/pk
5065-4422	Double winged nuts and 1/32" ferrules	10/pk
5063-6592	1/32" ferrule and stainless steel lock ring, lite touch	10/pk
5022-2146	Union adjustment tool	2/pk
5022-2184	Universal ZDV union, stainless steel, no fittings	2/pk
8710-1534	Open end wrench, 4 mm	ea



Agilent Flow Cells & Replacement Parts

AGILENT FLOW CELLS AND REPLACEMENT PARTS		
PART NO	DESCRIPTION	COMMENTS
500 nL FLOW CELL AND REPLACEMENT PARTS		
G1315-68724	500 nL flow cell	Contains quartz flow cell with 10 mm path length and 500 nL volume and connecting capillaries, max 50 bar pressure
G1315-80001	Quartz cell body, 10 mm	
G1315-87101	Cell seal assembly, 500 nL	
G1315-87333	Fused silica/PEEK capillary, 100 µm ID, 30 cm long	Inlet
G1315-87323	Fused silica/PEEK capillary, 50 µm ID, 40 cm long	Inlet
G1315-87338	Fused silica/PEEK capillary, 100 µm ID, 12 cm long	Outlet
G1315-87328	Fused silica/PEEK capillary, 50 µm ID, 12 cm long	Outlet
80 nL FLOW CELL AND REPLACEMENT PARTS		
G1315-68716	80 nL flow cell	Contains quartz flow cell with 6 mm path length and 80 nL volume and connecting capillaries, max 50 bar pressure
G1315-80002	Quartz cell body, 80 nL, 6 mm path length	
G1315-87323	Fused silica/PEEK capillary, 50 µm ID, 40 cm long	Inlet
G1315-87328	Fused silica/PEEK capillary, 50 µm ID, 12 cm long	Outlet
G1315-87313	Fused silica/PEEK capillary, 25 µm ID, 20 cm long	Inlet
G1315-87318	Fused silica/PEEK capillary, 25 µm ID, 60 cm long	Outlet
PREPARATIVE FLOW CELL AND REPLACEMENT PARTS		
G1315-60017	Preparative flow cell, 0.3 mm, 20 bar, quartz	
G1315-60018	Preparative flow cell, 0.06 mm, 20 bar, quartz	
G1315-67301	PTFE tubing, 0.8 mm ID, 2 m	
G1315-67302	PTFE tubing, 0.5 mm ID, 0.8 m	
G1315-27705	Cell housing	
0100-1516	1/16" finger-tight PEEK fitting, 2/pk	
G1315-80004	Quartz body, 0.3 mm	
G1315-60016	Prep flow cell, stainless steel, 3 mm, 120 bar	
G1315-87305	Stainless steel connecting capillary, 0.5 mm, 250 mm	



Agilent G1362A 1100/1200 Series Refractive Index Detector (RID) Supplies

AGILENT G1362A 1100/1200 SERIES REFRACTIVE INDEX DETECTOR (RID) SUPPLIES	
PART NO	DESCRIPTION
G1362-68706	Interface tubing kit: Includes 1/8" ferrule, 1/3" nut, PTFE tubing
G1362-87300	Interface capillary, 400 mm, 0.17 mm ID
G1362-87301	Restriction capillary, 0.17 mm ID

Agilent G1321A/B 1100/1200 Series Fluorescence Detector (FLD) Supplies

AGILENT G1321A/B 110/1200 SERIES FLUORESCENCE DETECTOR (FLD) SUPPLIES	
PART NO	DESCRIPTION
2140-0600	Detector lamp
G1321-60005	Flow cell, 8 µL, 20 bar
G1321-60015	Flow cell, 4 µL
G1321-60007	Cuvette kit, 8 µL, 20 bar: Includes tubing, stainless steel fitting, front and back ferrule, PEEK fitting, syringe needle and syringe
CUT-OFF FILTER KIT:	
5062-2463	Corrugated tubing, polypropylene, 6.5 mm ID, 5 m
5062-2462	PTFE tubing, FEP, 0.7 mm ID, 5 m
0100-1516	1/16" finger-tight PEEK fitting, 2/pk
G1315-87311	Column connecting capillary with fittings, 380 x 0.17 mm
5180-4108	1/16" stainless steel front ferrule, 10/pk
5180-4114	1/16" stainless steel back ferrule, 10/pk
5061-3303	1/16" stainless steel fitting, 10/pk
5063-6597	Fluorescence detector calibration sample, 1 g glycogen
8710-0510	Open end wrench, 1/4 and 5/16"
9301-1446	Glass syringe
9301-0407	Syringe needle

G1321-60005



0100-1516



5180-4108



5180-4114



Agilent LC/MS Supplies & Chemicals

AGILENT LC/MS SUPPLIES		6100 SERIES SINGLE QUADRUPOLE	6200 SERIES TOF	6300 SERIES ION TRAP	6400 SERIES TRIPLE QUADRUPOLE	6500 SERIES ACCURATE- MASS Q-TOF
PART NO	DESCRIPTION					
LC/MS SUPPLIES						
G1946-67098	Tested ESI nebulizer assembly	•	•	•	•	•
G2427A	ES nebulizer needle (original) replacement kit	•	•	•	•	•
G1958-60137	Nebulizer (needle SST316 replacement) kit	•	•	•	•	•
G1946-67037	Tested APCI nebulizer assembly	•	•	•	•	•
G2428A	APCI nebulizer needle replacement kit	•	•	•	•	•
G1947-20029	Corona needle APCI/Multimode	•	•	•	•	•
G1946-20301	Capillary cap, high temperature, 3.0 mm	•	•	•	•	•
G1946-80009	Capillary, 0.5 mm ID, dielectric*	•		•		
59987-20040	Capillary, 0.6 mm ID, dielectric*	•	•	•	•	•
G1960-80060	Capillary, 0.6 mm ID, resistive, fast polarity switching*				•	
1460-2571	Spring, canted coil, 0.25" ID, 0.53 mm	•	•	•	•	•
0100-0969	1/6" tee, low dead volume, stainless steel		•			•
9301-1291	Syringe adapter			•		
0100-1516	1/16" finger-tight PEEK fitting		•	•		•
0890-1915	PEEK tubing		•	•		•
5190-1530	Syringe, 1 mL, PTFE, fixed Luer lock		•	•		•
G2571-80103	HED assembly (G6140A, G6460A, G6530A)				•	
05971-80103	Electron multiplier replacement horn	•	•		•	
G2441-80010	Replacement horn and dynode	•		•	•	
LC/MS CHEMICALS						
G1946-85004	ES/APCI positive ion performance standard	•	•		•	•
G1978-85000	ESI+APCI LC demo sample	•				
G2425A	APCI negative ion performance standard, 5 x 1 mL ampoules	•				
G1946-85004	ES/APCI positive ion performance standard	•				
G1946-85004	ES/APCI positive ion performance standard	•				
G1969-85001	ES-TOF reference mix, 6 x 2 mL ampoules		•			•
G1969-85003	ES-TOF biopolymer reference standard kit		•			
G1969-85026	Flushing solvent	•	•	•	•	•

*Dielectric capillary supports standard polarity switching only. Resistive capillary supports fast polarity switching.



G1947-20029



05971-80103



CHROM TECH RELATED PRODUCTS

0.5 μm

Expanded Offering!
Now available in three particle sizes:
1.9 μm (NEW!)
2.7 μm
4 μm

Poroshell 120 Particle

Agilent InfinityLab Poroshell 120 LC Columns, page 60



Agilent Certified Vials, page 18

Agilent LC/MS Foreline Pump Supplies

AGILENT LC/MS FORELINE PUMP SUPPLIES	
PART NO	DESCRIPTION
3162-1056	Oil mist filter kit for E1M18/E2M28
G1960-80039	Oil mist cartridge filter for MS40+
3162-1057	Oil return kit
6040-0834	Foreline pump (rotary pump) oil, Inland 45, 1 L, for E1M18/E2M28
6040-0798	Foreline pump (rotary pump) oil, 4 L, for E1M18/E2M28
1535-4970	Oil mist filter element for E2M18
0100-0549	KF25 clamp, stainless steel
0100-1597	KF25 coseal (inside clamp)
G6011A	Quiet Cover MS for vacuum pump model: Agilent MS40+
G3199B	Quiet Cover 2.0 for vacuum pump models: BOC Edwards E2M28, E2M18, E1M18



Adding foreline pump (rotary pump) oil, 4 L

G6011A
Quiet Cover for vacuum pump



Removable oil tray

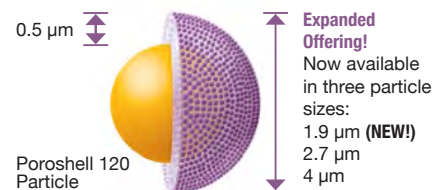
Easy access to pump

Agilent LC/MS Common Supplies

AGILENT LC/MS COMMON SUPPLIES*	
PART NO	DESCRIPTION
COMMON PARTS	
G1960-67100	Universal inlet filter replacement kit, includes: inlet filter, flexible capillaries 105 mm, stainless steel capillary 130 x 0.12 mm, union, column connect capillary 150 x 0.12 mm
0100-1854	Rotor seal, Tefzel, pH 0 – 14
0100-1855	Rotor seal, Vespel, pH 0 – 10
1460-2571	Spring, canted coil
CLEANING SUPPLIES	
8660-0827	Abrasive mesh, 4000 grit
G1946-80054	Capillary cleaning wire for dip tube
5190-1401	Cleaning powder, dielectric capillary, Alconox
05980-60051	Cloths, lint-free
5080-5400	Cotton swabs, 100/pk
GAS PURIFIERS	
BHT-4	Big hydrocarbon trap, 1/4" fittings
BMT-4	Big moisture trap, 1/4" fittings
RMSN-4	Big universal trap, 1/4" fittings
RMSN-2	Big universal trap, 1/8" fittings, Nitrogen
TOOLS	
G1946-60157	LC/MS tool kit
G1960-67470	Nebulizer Adjustment Kit
8710-1930	Plastic tubing cutter
8710-0510	Open end wrench, 1/4 and 5/16"
8710-0806	Wrench, 1/2 and 7/16"
8710-0004	Needle nose pliers, pointed serrated jaws

*These parts are common to all LC/MS systems

CHROM TECH RELATED PRODUCTS



Poroshell 120 Particle

Agilent InfinityLab Poroshell 120 LC Columns, page 60



Agilent Certified Vials, page 18

Agilent LC/MS Calibrant Mixes

AGILENT LC/MS CALIBRANT MIXES	
PART NO	DESCRIPTION
G2421-60001	Calibrant, ES
G2432A	APCI/APPI calibrant solution, 100 mL
G2431A	ESI tuning mix for ion trap, 100 mL
G1969-85000	ES-TOF tuning mix, 100 mL
G1969-85010	APCI-L low concentration tuning mix 100 mL
G1969-85020	MMI-L low concentration tuning mix, 100 mL

LC/MS Calibrant Mix and Source Compatibility Matrix

LC/MS CALIBRANT MIX AND SOURCE COMPATIBILITY MATRIX						
SOURCE	6100 SERIES SINGLE QUADRUPOLE*	6140A/6150B SINGLE QUADRUPOLE	6200 SERIES TOF	6300 SERIES ION TRAP	6400 SERIES TRIPLE QUADRUPOLE	6500 SERIES ACCURATE-MASS Q-TOF
ESI	G2421-60001	G1969-85000	G1969-85000	G2431A	G1969-85000	G1969-85000
APCI	G2432A	G1969-85010	G1969-85010	G2432A	G1969-85010 ²	G1969-85010 ²
APPI	G2432A	G2432A	G1969-85010	G2432A	G2432A ²	G1969-85010 ²
MMI	G2432A	G1969-85000	G1969-85020	G2432A	G1969-85020	G1969-85020
NanESI	—	—	G1969-85000 ⁴	G2431A	—	G1969-85000 ⁴
HPLC-Chip Cube	—	G1969-85000 ²	G1969-85000 ⁴	G2431A ¹	G1969-85000 ³	G1969-85000 ⁴

*G6110A, G6120A/B, G6130A/B

1) 5X dilution suggested

2) No autotune

3) ESI positive tune only

4) Calibration only

NEW! Safer Agilent Laboratory Solvent Bottles

Agilent's new solvent bottles have been redesigned for easier use and safer handling, lowering the risk of accidents in the lab. The new bottles feature an ergonomic design with a slimmer profile and ergonomically shaped gripping zones on both sides of the bottle, promoting easier and safer usage. A predefined labeling area compatible with self-adhesive bottle labels, which stay on when you need them to, and colorful silicone bottle tags mean that you can clearly and unambiguously identify solvent compositions. An easy to read durable white ceramic print layout clearly indicates the nominal volume of the bottle and allows you to quickly determine the rest contents of the bottle.



AGILENT SOLVENT BOTTLES	
PART NO	DESCRIPTION
9301-6527	Solvent bottle, clear, 125 mL
9301-6523	Solvent bottle, clear, 500 mL with cap
9301-6524	Solvent bottle, clear, 1000 mL
9301-6528	Solvent bottle, clear, 1000 mL with cap
9301-6525	Solvent bottle, amber, 500 mL with cap
9301-6526	Solvent bottle, amber, 1000 mL
9301-6529	Identification Silicone ring (8/pk with 4 different colors)
9301-6530	Sticker for solvent bottles, 100/pk

ASI Replacement Parts for HPLC Pumps

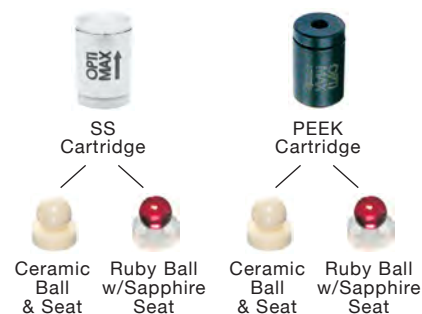
- All check valves are self-priming, no external priming valve/syringe required
- Designed to deliver superior flow stability and accuracy
- Crush proof cartridge makes routine maintenance quick and easy
- Pistons are engineered to insure a high quality surface finish
- Seals are designed for long life, wide range of solvent compatibility and optimum performance

Whether they are check valves, pistons or pump seals, all ASI replacement parts are designed to exceed the manufacturers specifications. All parts are subjected to rigorous engineering analysis and quality standards to insure the parts you purchase provide maximum life and superior chromatographic performance. Replacement parts are available for most HPLC pumps.

Optimize Technologies Replacement Parts for HPLC Instrumentation

Optimax Universal Cartridge for Opti-Max Housings

A single Opti-Max cartridge is interchangeable across multiple pump brands and can function in either the inlet or outlet position. The same Opti-Max cartridge will fit into Opti-Max housings for pump manufactured by Waters, Shimadzu, Agilent/HP, and many other OEM solvent delivery systems.



CARTRIDGE MATERIAL OPTIONS (2/PK)				
	DESCRIPTION	CARTRIDGE BODY	BALL AND SEAT	PART NO
1/32"	Cartridge fits in all housings that will take 1/16" and 1/8" cartridges.	PEEK/PPS	Ruby/Sapphire	10-39-02004
1/16"	Recommended: Microbore cartridge	SS	Ceramic	10-46-02004
	Microbore cartridge	PEEK	Ceramic	10-48-02004
	Microbore cartridge	SS	Ruby/Sapphire	10-47-02004
	Microbore cartridge	PEEK	Ruby/Sapphire	10-49-02004
1/16" UHPLC	Single ball & seat cartridge, rated to 18,000 PSI	SS	Ceramic	10-76-02004
	Double ball & seat cartridge, rated to 20,000 PSI	SS	Ceramic	10-76-02004
1/8"	Recommended: Standard cartridge	SS	Ceramic	10-56-02004
	Standard cartridge	PEEK	Ceramic	10-58-02004
	Standard cartridge	SS	Ruby/Sapphire	10-57-02004
	Standard cartridge	PEEK	Ruby/Sapphire	10-59-02004

**We cannot guarantee the Opti-Max check valve cartridge will fit in OEM housings. Opti-Max cartridges must be used with Opti-Max housing for optimal results.*


TECH TIP

Cartridge Material Recommendations

For high mechanical strength, stainless steel cartridges are the best choice. Ceramic ball & seat sets have higher density, which can make the valve more responsive and help the ball seat faster in lighter solvents.

For biocompatible HPLC systems with nonmetallic flow paths or high percentages of THF, use PEEK cartridges with ceramic balls & seats.

Optimax Free Turn Housing

Most Opti-Max check valve housings feature the Free-Turn design. To see if they are available for your system, look for the Free-Turn logo  next to the Opti-Max listings for your HPLC.

Optimax FREE TURN® housings can be removed with the tubing still attached, accelerating check valve maintenance while reducing fitting wear.



Place wrench on the hex nut and turn. The hex nut or thread ring will turn independently of the fitting connection.



Continue to unscrew the thread ring until the entire check valve assembly is removed from the pump head.




Discard old check valve cartridge and replace with new cartridge.



Install entire assembly into pump head.

Replacement Pump Supplies for Agilent/HP Instruments

CHECK VALVES FOR AGILENT/HP INSTRUMENTS						
PART NO	ACN COMPATIBLE PART NO	FITS MODEL	DESCRIPTION	QTY	OEM PART NO	MANUFACTURER
250-1410	250-1410ACN	1090	Inlet Valve Assy (Cartridge and Housing)	ea	79835-25211, 79835-67101	ASI
250-1390	250-1390ACN	1090	Repl Inlet Cartridge	ea		ASI
250-1415	250-1415ACN	1090	Outlet Valve Assy (Cartridge and Housing)	ea	79835-25211, 79835-67101	ASI
250-1395	250-1395ACN	1090	Repl Outlet Cartridge	ea		ASI
27-38-00680	—	1090	Inlet Valve Assy (Cartridge and Housing)	ea	79835-25211	Optimize Tech
27-38-00682	—	1090	Outlet Valve Assy (Cartridge and Housing)	ea	79835-25211	Optimize Tech
27-38-00672	—	1090	Cartridge Check Valve Replacement	2/pk	79835-67101	Optimize Tech
250-1417	250-1417ACN	1050, 1100, 1200	Outlet Valve Assy (Cartridge and Housing)	ea	01018-60008	ASI
250-1397	250-1397ACN	1050, 1100, 1200	Repl Outlet Cartridge	ea		ASI
250-2300	—	1050, 1100, 1200	Inlet AIV Cartridge, Direct Replacement	ea	G1312-60020, 5062-8562	ASI
27-56-01330	—	1050, 1100, 1200	OPTI-MAX Outlet Valve Assy, 1/8" (Cartridge and Housing)	ea	G1312-60067, G1311-60012, G1312-60012	Optimize Tech 
10-56-02004	—	1050, 1100, 1200	Repl OPTI-MAX Outlet Cartridge, 1/8"	ea	G1312-60067, G1311-60012, G1312-60012	Optimize Tech

PISTON SEALS FOR AGILENT/HP INSTRUMENTS						
PART NO (ea)	PART NO (10/pk)	FITS MODEL	DESCRIPTION	MATERIAL	OEM PART NO	MANUFACTURER
200-1367	200-1368	1090	Piston Seal	PTFE	5062-2494	ASI
27-36-00665	27-36-00666	1090	Piston Seal	ITB PTFE	5062-2494	Optimize Tech
200-1350	200-1355	1050, 1100, 1200	Piston Seal	UHMWPE	0905-1420	ASI
200-1357	200-1358	1050, 1100, 1200	Piston Seal	PTFE	5063-6589	ASI
27-36-01570	27-36-01571	1050, 1100, 1200	OPTI-SEAL Piston Seal	UHMWPE	0905-1420	Optimize Tech
27-36-01572	27-36-01573	1050, 1100, 1200	Piston Seal	ITB PTFE	5063-6589	Optimize Tech
27-36-03073	27-36-03074	1050, 1100, 1200	Piston Seal, Green Premium Grade	PTFE*		Optimize Tech
27-36-02364	27-36-02365	1050, 1100, 1200	OPTI-SEAL Wash Seal	UHMWPE	0905-1175	Optimize Tech
27-36-02366	27-36-02367	1050, 1100, 1200	Wash Seal	ITB PTFE	0905-1175	Optimize Tech
27-36-02851	—	1050, 1100, 1200	Gasket Wash Seal, 6/pk	FEP	5062-2484	Optimize Tech
27-36-03076	—	1050, 1100, 1200	Seal, 2/pk	ITB		Optimize Tech

* Premium Grade PTFE for maximum chemical compatibility and wear resistance

PISTONS FOR AGILENT/HP INSTRUMENTS						
PART NO	FITS MODEL	DESCRIPTION	MATERIAL	OEM PART NO	MANUFACTURER	
260-1340	1090	Piston	Sapphire	3980-0672	ASI	
27-34-00671	1090	Piston	Sapphire	3980-0672	Optimize Tech	
260-1330	1050, 1100, 1200	Piston	Sapphire	5063-6586	ASI	
27-34-00658	1050, 1100, 1200	Piston	Sapphire	5063-6586	Optimize Tech	

MISCELLANEOUS PUMP SUPPLIES FOR AGILENT/HP INSTRUMENTS						
PART NO	FITS MODEL	DESCRIPTION	MATERIAL	QTY	OEM PART NO	MANUFACTURER
27-04-02852	1100, 1050, 1200	Frits	PTFE	5/pk	01018-22707	Optimize Tech
250-1130	1100, 1050, 1200	Frits	PTFE	5/pk		ASI
27-31-02853	1100, 1050, 1200	2-In-1 Seal Cap*		ea	5062-2485, 5001-3707, 5067-4728	Optimize Tech
27-31-03075	1100, 1050, 1200	2-in-1 Seal Cap*		4/pk	5062-2485, 5001-3707, 5067-4728	Optimize Tech

*The 2-in-1 Seal Cap replaces both the OEM outlet gold seal and outlet cap with a single component. Use it on your purge valve, OEM outlet check valve, or anywhere else on your 1050/1100/1200 system where gold seals and outlet caps are required.

Replacement Detector Supplies for Agilent/HP Instruments

LAMPS FOR AGILENT/HP INSTRUMENTS				
PART NO	FITS MODEL	DESCRIPTION	OEM PART NO	MANUFACTURER
L-295	1050 VWD, 79853A	D2 Lamp		Sonnitek
LH-10	1050 C, 1050 DAD, 1090, 1040, 1040A, 1040M, 79881A, 79853C, 79854A, G1306A, 79880A, 79881A	D2 Lamp & Holder		Sonnitek
27-32-02844	1050 C, 1050 DAD, 1090, 1040, 79583C	D2	79883-60002	Optimize Tech
LH-14	1100 VWD, 1200 VWD, G1314A, G1314B, G1314C, G1314D, G1314E, G1314F, G1600CE, G1601CE, G1600AX, HP3D/CE	D2 Lamp and Holder		Sonnitek
27-32-02715	1100 VWD, 1200 VWD, G1314A	D2 Lamp	G1314-60100	Optimize Tech
27-32-02846	1100 VWD, 1200 VWD	D2 DoubleLife Lamp	G1314-60100	Optimize Tech
LH-13	1100 DAD, 1200 DAD, G1315A, G1315B, G1315C, G1315D, G1315E, G1365A, G1365B, G1365C, G1365D	D2 Lamp & Holder		Sonnitek
LH-13X2	1100 DAD, 1200 DAD, G1315A, G1315B, G1315C, G1315D, G1315E, G1365A, G1365B, G1365C, G1365D	D2 Lamp, Long life		Sonnitek
27-32-02845	1100 DAD, 1200 DAD	D2 DoubleLife Lamp	5181-1530, 2140-0813	Optimize Tech
L-850	1100 DAD, 1200 DAD, G1315A, G1315B, G1315C, G1315D, G1315E, G1365A, G1365B, G1365C, G1365D, G4212 A/B	Tungsten Lamp		Sonnitek
LH-16	Cary 8450A	D2 Lamp & Holder		Sonnitek
LH-11	Cary 8451A	D2 Lamp		Sonnitek
LH-12	Cary 8452A	D2 Lamp & Holder		Sonnitek
LH-13X2	Cary 8453A, Cary 8454	D2 Lamp, Long life		Sonnitek
LH-15	Cary 8453A, Cary 8453E, Cary 8454	D2 Lamp		Sonnitek
L-850	Cary 8453A, Cary 8453E, Cary 8454	Tungsten Lamp		Sonnitek

Replacement Autosampler Supplies for Agilent/HP Instruments

NEEDLE SEATS FOR AGILENT/HP INSTRUMENTS				
PART NO	FITS MODEL	DESCRIPTION	OEM PART NO	MANUFACTURER
27-31-03329	1100, 1200	Needle Seat Assembly	G1313-87101, G1329-87017	Optimize Tech
27-31-03146	1100, 1200	Needle Seat Assembly, 2 piece ferrule	G1313-87101, G1329-87017	Optimize Tech
27-31-03215	1100, 1200	Needle	G1313-87201	Optimize Tech

ROTOR SEALS FOR AGILENT/HP INSTRUMENTS				
PART NO	FITS MODEL	DESCRIPTION	OEM PART NO	MANUFACTURER
27-31-03603	1050	Polyimide Rotor Seal	0101-0626	Optimize Tech
27-31-03670	1090	Polyimide Rotor Seal Assembly, 2 Grooves, Vespel	0101-0623	Optimize Tech
27-31-03649	1090	Polyimide Rotor Seal Assembly, 3 Grooves, Vespel	1535-4048, 7010-039	Optimize Tech
27-31-03212	1100, 1200	Polyimide Rotor Seal Assembly	0100-1853	Optimize Tech



CHROM TECH RELATED PRODUCTS



Upchurch Scientific
General Use Inlet
Stainless Steel Solvent
Filters, page 268



Why use an Inlet Solvent Filter?

To filter out particulate matter from the solvent that may otherwise damage expensive hardware. (Use a 10 µm or 20 µm version for this purpose.)

It is usually a good idea to change the inlet filter as part of your semi-annual or annual preventative maintenance program.

Replacement Pump Supplies for Beckman/Altex Instruments

CHECK VALVES FOR BECKMAN/ALTEX INSTRUMENTS

PART NO	ACN COMPATIBLE PART NO	FITS MODEL	DESCRIPTION	QTY	OEM PART NO	MANUFACTURER
250-1260	250-1260ACN	100A, 110A, 110B, 112, 112M, 114, 114M, 116, 118, 125, 126, 127, 128	Inlet Valve Assy (Cartridge and Housing)	ea	240720	ASI
250-1240	250-1240ACN	100A, 110A, 110B, 112, 112M, 114, 114M, 116, 118, 125, 126, 127, 128	Repl Inlet Cartridge	ea		ASI
250-1265	250-1265ACN	100A, 110A, 110B, 112, 112M, 114, 114M, 116, 118, 125, 126, 127, 128	Outlet Valve Assy (Cartridge and Housing)	ea	240721	ASI
250-1245	250-1245ACN	100A, 110A, 110B, 112, 112M, 114, 114M, 116, 118, 125, 126, 127, 128	Repl Outlet Cartridge	ea		ASI
22-66-00516	—	100A, 110A, 110B, 112, 112M, 114, 114M, 116, 118, 125, 126, 127, 128	OPTI-MAX Inlet Valve Assy (Cartridge and Housing)	ea	240720	Optimize Tech 
22-66-00520	—	100A, 110A, 110B, 112, 112M, 114, 114M, 116, 118, 125, 126, 127, 128	OPTI-MAX Outlet Valve Assy (Cartridge and Housing)	ea	240721	Optimize Tech 
10-66-02005	—	100A, 110A, 110B, 112, 112M, 114, 114M, 116, 118, 125, 126, 127, 128	OPTI-MAX Repl Cartridges	2/pk		Optimize Tech

PISTON SEALS FOR BECKMAN/ALTEX INSTRUMENTS

PART NO (ea)	PART NO (10/pk)	FITS MODEL	DESCRIPTION	MATERIAL	QTY	OEM PART NO	MANUFACTURER
200-1240	200-1241	100A, 110A, 110B	Piston Seal	UHMWPE	ea	887138	ASI
200-1245	—	100A, 110A, 110B	Piston Seal Insertion Tool		ea		ASI
93-0003	—	100A, 110A, 110B	Piston Seal	PTFE	ea	887138	Sciencix
200-1255	200-1256	112, 112M	Piston Seal	UHMWPE	ea	236797	ASI
200-1250	200-1251	114, 114M, 116, 118, 125, 126, 127, 128	Piston Seal	UHMWPE	ea	237162	ASI
22-36-00496	22-36-00497	114, 114M, 116, 126	Piston Seal	ITB PTFE	ea	241037	Optimize Tech
93-0008	—	114M, 116, 118, 125, 126, 127, 128	Piston Seal	UHMWPE	ea		Sciencix
93-0007	—	114M, 116, 118, 125, 126, 127, 128	Piston Seal	PTFE	ea	241037	Sciencix
22-36-00484	22-36-00485	105 Prep, 110 Prep	OPTI-SEAL Piston Seal	UHMWPE	ea	887139	Optimize Tech
22-36-00486	22-36-00487	105 Prep, 110 Prep	Piston Seal	ITB PTFE	ea	887139	Optimize Tech

BECKMAN/ALTEX PISTONS FOR BECKMAN/ALTEX INSTRUMENTS



PART NO	FITS MODEL	DESCRIPTION	MATERIAL	QTY	OEM PART NO	MANUFACTURER
92-0012	110A, 110B, 112	Piston	Sapphire	ea	243053	Sciencix
260-1140	110A, 110B, 112, 112M	Piston	Sapphire	ea	243053	ASI
260-1145	114, 114M, 116, 118, 125, 126, 127, 128	Piston	Sapphire	ea	240714	ASI
22-34-00476	114, 114M, 116, 126	Piston	Sapphire	ea	240714	Optimize Tech

Replacement Detector Supplies for Beckman/Altex Instruments

LAMPS FOR BECKMAN/ALTEX INSTRUMENTS

PART NO	FITS MODEL	DESCRIPTION	QTY	OEM PART NO	MANUFACTURER
LHA-70	166	D2 Lamp, Complete Assembly	ea		Sonnitek
LH-70	166	D2 Lamp & Holder	ea		Sonnitek
LHA-75	168	D2 Lamp, Complete Assembly	ea		Sonnitek
LH-75	168	D2 Lamp & Holder	ea		Sonnitek
L-205	163	D2 Lamp	ea		Sonnitek
22-32-01295	163	D2 Lamp	ea	22 947029	Optimize Tech
LH-72	DU-600, 640, 650, 800, 6000, 7000, 7500	D2 Lamp & Holder	ea		Sonnitek

Replacement Pump Supplies for PerkinElmer Instruments

CHECK VALVES FOR PERKINELMER INSTRUMENTS						
PART NO	ACN COMPATIBLE PART NO	FITS MODEL	DESCRIPTION	QTY	OEM PART NO	MANUFACTURER
250-1800	250-1800ACN	Series 4, 200, 400, 410, 620, Model 250, Integral 4000	Inlet Valve Assy (Cartridge and Housing)	ea	0254-0177	ASI
250-1780	250-1780ACN	Series 4, 200, 400, 410, 620, Model 250, Integral 4000	Repl Inlet Cartridge	ea		ASI
250-1805	250-1805ACN	Series 4, 200, 400, 410, 620, Model 250, Integral 4000	Outlet Valve Assy (Cartridge and Housing)	ea	0254-0197	ASI
250-1785	250-1785ACN	Series 4, 200, 400, 410, 620, Model 250, Integral 4000	Repl Outlet Cartridge	ea		ASI
33-56-00830	—	Series 4, 200, 400, 410, 620, Model 250, Integral 4000	OPTI-MAX Inlet Valve Assy (cartridge & holder)	ea	0254-0177	Optimize Tech 
33-56-00835	—	Series 4, 200, 400, 410, 620, Model 250, Integral 4000	OPTI-MAX Outlet Valve Assy (cartridge & holder)	ea	0254-0197	Optimize Tech 
10-46-02004	—	Series 4, 200, 400, 410, 620, Model 250, Integral 4000	OPTI-MAX Repl Cartridges (inlet/outlet)	2/pk		Optimize Tech
250-1830	250-1830ACN	Series 1, 2, 3, 3B, 10	Inlet Valve Assy (Cartridge and Housing)	ea	0254-0546	ASI
250-1810	250-1810ACN	Series 1, 2, 3, 3B, 10	Repl Inlet Cartridge	ea		ASI
250-1835	250-1835ACN	Series 1, 2, 3, 3B, 10	Outlet Valve Assy (Cartridge and Housing)	ea	0254-0547	ASI
250-1815	250-1815ACN	Series 1, 2, 3, 3B, 10	Repl Outlet Cartridge	ea		ASI

PISTON SEALS FOR PERKINELMER INSTRUMENTS						
PART NO (ea)	PART NO (10/pk)	FITS MODEL	DESCRIPTION	MATERIAL	OEM PART NO	MANUFACTURER
200-1512	200-1517	Series 1, 2, 3, 3B, 4, 10, 200, 400, 410, 620, Model 250, Integral 4000	High Pressure Piston Seal w/Back-up Ring & Back-up O-Ring	UHMWPE	0990-7324	ASI
200-1510	200-1515	Series 1, 2, 3, 3B, 4, 10, 200, 400, 410, 620, Model 250, Integral 4000	High Pressure Piston Seal w/Back-up Ring & Back-up O-Ring	PTFE	0990-7331	ASI
33-36-01301	33-36-01302	Series 1, 2, 3, 3B, 4, 10, 200, 400, 410, 620, Model 250, Integral 4000	High Pressure OPTI-SEAL Piston Seal	UHMWPE	0990-7324	Optimize Tech
33-36-01299	33-36-01300	Series 1, 2, 3, 3B, 4, 10, 200, 400, 410, 620, Model 250, Integral 4000	High Pressure Piston Seal	ITB PTFE	0990-7328	Optimize Tech
200-1520	200-1525	Series 4, 200, 400, 410, 620, Model 250, Integral 4000	Low Pressure Piston Seal	PTFE	0990-7330	ASI
200-1521	—	Series 4, 200, 400, 410, 620, Model 250, Integral 4000	Low Pressure Piston Seal Guide		0254-2313	ASI
33-36-00804	33-36-00805	Series 4, 200, 400, 410, 620, Model 250, Integral 4000	Low Pressure Piston Seal	UHMWPE	0990-7330, 09907339	Optimize Tech
33-36-00802	33-36-00803	Series 4, 200, 400, 410, 620, Model 250, Integral 4000	Low Pressure Piston Seal	ITB PTFE	0990-7330, 0990-7339	Optimize Tech
200-1530	200-1535	Series 10	Wash Seal	UHMWPE		ASI
33-36-00806	33-36-00807	Series 100	OPTI-SEAL Piston Seal	UHMWPE	N260-0108	Optimize Tech
33-36-00808	33-36-00809	Series 100	Piston Seal	ITB PTFE	N260-0109	Optimize Tech



CHROM TECH RELATED PRODUCTS



**Upchurch Scientific
General Use Inlet
Stainless Steel Solvent
Filters, page 268**

Why use an Inlet Solvent Filter?

To filter out particulate matter from the solvent that may otherwise damage expensive hardware. (Use a 10 µm or 20 µm version for this purpose.)

It is usually a good idea to change the inlet filter as part of your semi-annual or annual preventative maintenance program.

Replacement Pump Supplies for PerkinElmer Instruments (cont.)

PISTONS FOR PERKINELMER INSTRUMENTS						
PART NO	FITS MODEL	DESCRIPTION	MATERIAL	QTY	OEM PART NO	MANUFACTURER
260-1830	Series 4, 200, 400, 410, 620, Model 250, Integral 4000 (Mfd. After 12/89)	High Pressure Piston w/Cam Follower Bearing & 2 Yoke Bushings	Sapphire	ea	N260-0124	ASI
33-34-00798	Series 4, 200, 400, 410, 620, Model 250, Integral 4000 (Mfd. After 12/89)	High Pressure Piston	Sapphire	ea	N260-0124	Optimize Tech
260-1840	Series 4, 200, 400, 410, 620, Model 250, Integral 4000 (Mfd. After 12/89)	Low Pressure Piston	Sapphire	ea	N260-0104	ASI
33-34-00797	Series 4, 200, 400, 410, 620, Model 250, Integral 4000 (Mfd. After 12/89)	Low Pressure Piston	Sapphire	ea	N260-0104	Optimize Tech
260-1800	Series 10	Self-flush Piston	Sapphire	ea	0254-2442	ASI

Replacement Detector Supplies for PerkinElmer Instruments

LAMPS FOR PERKINELMER INSTRUMENTS					
PART NO	FITS MODEL	DESCRIPTION	QTY	OEM PART NO	MANUFACTURER
33-32-03117	Series 200 UV-VIS	D2 Lamp	ea	N292-0149	Optimize Tech
LH-98	Series 200 UV-VIS	D2 Lamp	ea		Sonntek
LH-97	Series 200 DAD	DoubleLife™ D2 Lamp	ea		Sonntek
L-210	Integral 4000, LC-55, LC-55B, LC-65, LC-75, LC-85B, LC-95, LC-135, LC-235	D2 Lamp	ea		Sonntek
LH-92	LC-480, Lambda 2, 5, 7, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 25, 35, 40, 45, 800, 900, Bio	D2 Lamp	ea		Sonntek
L-200	Lambda 1, 46, 55, 57, 3840, 552A, 553, 559, 559A, 570, 571, 572, 575, 576	W Lamp	ea		Sonntek
LH-845	Lambda 1, 2, 3B, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 40, 800, 900, Bio	W Lamp	ea		Sonntek
L-240	550, 551, 552, 555	D2 Lamp	ea		Sonntek
LH-51	220, 320, 330, 340	D2 Lamp	ea		Sonntek

Replacement Autosampler Supplies for PerkinElmer Instruments

SYRINGE NEEDLES FOR PERKINELMER INSTRUMENTS					
PART NO	FITS MODEL	DESCRIPTION	QTY	OEM PART NO	MANUFACTURER
CTN-PE200	Series 200	Needle	ea	N2930023	Chrom Tech



CHROM TECH RELATED PRODUCTS



JT-PP12755



JT-TF12752-CC1



Vapor Filter



6 Port Manifold



Chrom Tech Solvent Waste Container Kit, page 262



412-0150



412-0150B

Female Ports are 10-32 Coned accept 1/16" OD tubing
Standard Assemblies are rated to 5,000 PSI. UHPLC Assemblies are rated to 15,000 PSI

ASI Static Mixers, page 245

Replacement Pump Supplies for Shimadzu Instruments

CHECK VALVES FOR SHIMADZU INSTRUMENTS							
PART NO	ACN COMPATIBLE PART NO	FITS MODEL	DESCRIPTION	MATERIAL	QTY	OEM PART NO	MANUFACTURER
250-1480	250-1480ACN	LC-10AD, LC-600, LC-9A	Inlet Valve Assy (cartridge & holder)		ea	228-18522-91	ASI
250-1460	250-1460ACN	LC-10AD, LC-600, LC-9A	Repl Inlet Cartridge		ea		ASI
250-1485	250-1485ACN	LC-10AD, LC-600, LC-9A	Outlet Valve Assy (cartridge & holder)		ea	228-18522-92	ASI
250-1465	250-1465ACN	LC-10AD, LC-600, LC-9A	Repl Outlet Cartridge		ea		ASI
250-1482	250-1482ACN	LC-6A, LC-10AS	Inlet Valve Assy (cartridge & holder)		ea	228-12353-91	ASI
250-1462	250-1462ACN	LC-6A, LC-10AS	Repl Inlet Cartridge		ea		ASI
250-1487	250-1487ACN	LC-6A, LC-10AS	Outlet Valve Assy (cartridge & holder)		ea	228-09054-93	ASI
250-1467	250-1467ACN	LC-6A, LC-10AS	Repl Outlet Cartridge		ea		ASI
34-56-00902	—	LC-6A, LC-10AS	OPTI-MAX Inlet Valve Assy (cartridge & holder)	SS	ea	228-12353-91	Optimize Tech
34-56-00907	—	LC-6A, LC-10AS	OPTI-MAX Outlet Valve Assy (cartridge & holder)	SS	ea	228-09054-93	Optimize Tech
10-56-02004	—	LC-6A, LC-10AS	OPTI-MAX Repl Cartridges (inlet/outlet)		2/pk		Optimize Tech
250-1484	250-1484ACN	LC-10AT, LC-10ATVP	Inlet Valve Assy (cartridge & holder)		ea	228-32166-91	ASI
250-1464	250-1464ACN	LC-10AT, LC-10ATVP	Repl Inlet Cartridge		ea		ASI
250-1505	—	LC-10AT, LC-10ATVP	Outlet Valve Assy (cartridge & holder)		ea		ASI
250-1492	—	LC-10AT, LC-10ATVP	Repl Outlet Cartridge		ea		ASI
34-46-01983	—	LC-10AT, LC-10ATVP	OPTI-MAX Inlet Valve Assy (cartridge & holder)	SS	ea	228-32166-91	Optimize Tech
34-46-00893	—	LC-10AT, LC-10ATVP	OPTI-MAX Outlet Valve Assy (cartridge & holder)	SS	ea	228-39093-92, 228-32531-92, 228-34976-91	Optimize Tech
10-46-02004	—	LC-10AT, LC-10ATVP	OPTI-MAX Repl Cartridges (inlet/outlet)		2/pk		Optimize Tech
250-1500	—	LC-10ADV, LC-20AB, LC-20AD, LC-20ADXR, LC-20AT	Inlet Valve Assy (cartridge & holder)		ea		ASI
250-1505	—	LC-10ADV, LC-20AB, LC-20AD, LC-20ADXR, LC-20AT	Outlet Valve Assy (cartridge & holder)		ea		ASI
250-1492	—	LC-10ADV, LC-20AB, LC-20AD, LC-20ADXR, LC-20AT	Repl Inlet and Outlet Cartridge		ea		ASI
34-46-02644	—	LC-10ADV, LC-2010	OPTI-MAX Inlet Valve Assy (cartridge & holder)	SS	ea	228-39093-92, 228-45704-91	Optimize Tech
34-46-00893	—	LC-10ADV, LC-2010	OPTI-MAX Outlet Valve Assy (cartridge & holder)	SS	ea	228-18522-92	Optimize Tech
10-46-02004	—	LC-10ADV, LC-2010	OPTI-MAX Repl Cartridges (inlet/outlet)		2/pk		Optimize Tech
34-86-02644	—	LC-20ADXR, LC-20ABXR	OPTI-MAX Inlet Valve Assy (cartridge & holder)	SS	ea	228-48249-91	Optimize Tech
34-86-00893	—	LC-20ADXR, LC-20ABXR	OPTI-MAX Outlet Valve Assy (cartridge & holder)	SS	ea	228-45705-91	Optimize Tech
10-86-02004	—	LC-20ADXR, LC-20ABXR	OPTI-MAX Repl Cartridges (inlet/outlet)		2/pk		Optimize Tech



CHROM TECH RELATED PRODUCTS



Upchurch Scientific
General Use Inlet
Stainless Steel Solvent
Filters, page 268

Why use an Inlet Solvent Filter?

To filter out particulate matter from the solvent that may otherwise damage expensive hardware. (Use a 10 µm or 20 µm version for this purpose.)

It is usually a good idea to change the inlet filter as part of your semi-annual or annual preventative maintenance program.

Replacement Pump Supplies for Shimadzu Instruments (cont.)

PISTON SEALS FOR SHIMADZU INSTRUMENTS						
PART NO (ea)	PART NO (10/pk)	FITS MODEL	DESCRIPTION	MATERIAL	OEM PART NO	MANUFACTURER
200-1420	200-1425	LC-600, LC-9A, LC-10AD, LC-10ADVP, LC-20AD, LC-2010	Piston Seal	PTFE	228-18745-00	ASI
200-1430	200-1435	LC-600, LC-9A, LC-10AD, LC-10ADVP, LC-20AD, LC-2010	Piston Seal	UHMWPE	228-21975-91 & 228-21975-00 & 228-21975-84	ASI
34-36-00855	34-36-00856	LC-600, LC-9A, LC-10AD, LC-10ADVP, LC-20AD, LC-2010	OPTI-SEAL	UHMWPE	228-18745-00	Optimize Tech
34-36-00857	34-36-00858	LC-600, LC-9A, LC-10AD, LC-10ADVP, LC-20AD, LC-2010	Elastomer Energized Piston Seal	UHMWPE	228-35146-00, 228-18745-00	Optimize Tech
200-1440	200-1445	LC-6A	Piston Seal	PTFE	228-11999-00	ASI
200-1441	—	LC-6A	Piston Seal Insertion Tool			ASI
200-1430	200-1435	LC-10AS, LC-10AT, LC-10ATVP, LC-20AT	Piston Seal	UHMWPE	228-21975-91	ASI
200-1432	200-1437	LC-10AS, LC-10AT, LC-10ATVP, LC-20AT	Piston Seal	PTFE	228-35145-00	ASI
200-1431	200-1436	LC-10AS, LC-10AT, LC-10ATVP, LC-20AT	Piston Wash Seal	UHMWPE	228-28499-00	ASI
34-36-00865	34-36-00866	LC-10AS, LC-10AT, LC-10ATVP, LC-20AT	OPTI-SEAL	UHMWPE	228-11999-00, 228-21975-00, 228-35145-00	Optimize Tech
34-36-00863	34-36-00864	LC-10AS, LC-10AT, LC-10ATVP, LC-20AT	Piston Seal	ITB PTFE	228-11999-00, 228-21975-00, 228-35145-00	Optimize Tech
200-1410	200-1415	LC-20ADXR	Piston Seal	UHMWPE	228-32628-91	ASI
34-36-04711	34-36-04712	LC-20ADXR	Piston Seal	ITB PTFE	228-18745-00, 228-35146-00	Optimize Tech
34-36-04709	34-36-04710	LC-20ADXR	OPTI-SEAL	UHMWPE	228-18745-00, 228-35146-00	Optimize Tech

PISTONS FOR SHIMADZU INSTRUMENTS						
PART NO	FITS MODEL	DESCRIPTION	MATERIAL	OEM PART NO	MANUFACTURER	
260-1320	LC-10AD, LC-600, LC-9A	Piston	Sapphire	228-18523-92	ASI	
34-34-00853	LC-10AD, LC-600, LC-9A	Piston	Sapphire	228-18523-92	Optimize Tech	
260-1310	LC-6A	Piston	Sapphire	228-12904-93	ASI	
34-34-00854	LC-6A	Piston	Sapphire	228-12904-93	Optimize Tech	
260-1305	LC-10AS	Piston	Sapphire	228-17019-93	ASI	
34-34-01345	LC-10AS	Piston	Sapphire	228-17019-93	Optimize Tech	
260-1302	LC-10AT, LC-10ATVP	Piston	Sapphire	228-35009-92	ASI	
34-34-02650	LC-10AT, LC-10ATVP	Piston	Sapphire	228-35009-92	Optimize Tech	
260-1303	LC-10ADVP, LC-20AD, LC-20ADXR	Piston	Sapphire	228-35601-91	ASI	
34-34-02645	LC-10ADVP, LC-20AD	Piston	Sapphire	228-35601-92, 228-35601-91	Optimize Tech	



CHROM TECH RELATED PRODUCTS



JT-PP12755



JT-TF12752-CC1



Vapor Filter



6 Port Manifold



Chrom Tech Solvent Waste Container Kit, page 262



412-0150



412-0150B

Female Ports are 10-32 Coned accept 1/16" OD tubing
Standard Assemblies are rated to 5,000 PSI. UHPLC Assemblies are rated to 15,000 PSI

ASI Static Mixers, page 245

Replacement Detector Supplies for Shimadzu Instruments

LAMPS FOR SHIMADZU INSTRUMENTS				
PART NO	FITS MODEL	DESCRIPTION	OEM PART NO	MANUFACTURER
LH-84	LC2010	D2		Sonntek
34-32-03102	LC2010	DoubleLife™ D2	228-37401-00	Optimize Tech
L-305	SP-4, SPD-2A, SPD-2AV, SPD-6A, SPD-6AV, SPD-7A, SPD-7AV	D2		Sonntek
LH-82	SPD-10A, SPD-10AV, SPD-10AVP, SPD-10AVVP	D2		Sonntek
L-830	SPD-10AV, SPD-10AVP, SPD-10AVVP	W		Sonntek
34-32-02837	SPD-10A, SPD-10AV, SPD-M10A, SPD-10AS, SPD-10AVP, SPD-M10AVP, SPD-20AV	DoubleLife™ D2	228-34016-02	Optimize Tech
L-935	SPD-M6A, SPD-M6A, SPD-M10A	W		Sonntek
LH-88	SPD-M10AVP	D2		Sonntek
L-245	SPD-M10AV, SPD-M10AVP	W		Sonntek
LH-87	SPD-M20A, SPD-M20AV	D2		Sonntek
L-245	SPD-M20A	W		Sonntek
L-830	SPD-20AV, SPD-M20AV	W		Sonntek

Autosampler Supplies for Shimadzu Instruments

ROTOR SEALS FOR SHIMADZU INSTRUMENTS				
PART NO	FITS MODEL	DESCRIPTION	OEM PART NO	MANUFACTURER
CT-A106	SIL-10A, SIL-10AI, SIL-10AXL, SIL-6B, SIL-9	Shimadzu Rotor Seal for SIL-10A	228-21217-91	Sciencix

Accessories for Shimadzu Instruments

ACCESSORIES FOR SHIMADZU INSTRUMENTS				
PART NO	FITS MODEL	DESCRIPTION	OEM PART NO	MANUFACTURER
34-04-03881	Shimadzu, LC-6AD, LC-6A, LC-610	In-line Filter, Shimadzu, LC-6AD, LC-6A, LC-610	228-12642-93	Optimize Tech
34-24-01327		Shimadzu Type SS Nut for 1/8" OD Tubing		Optimize Tech

Replacement Pump Supplies for Thermo Scientific Instruments

CHECK VALVES FOR THERMO SCIENTIFIC INSTRUMENTS							
PART NO	PART NO ACN COMPATIBLE	FITS MODEL	DESCRIPTION	MATERIAL	QTY	OEM PART NO	MANUFACTURER
50-46-01983	—	Thermo Surveyor L Pump	Inlet Valve Assy (cartridge & holder)	SS, Ceramic	ea	00950-30026	Optimize Tech
50-46-00893	—	Thermo Surveyor L Pump	Outlet Valve Assy (cartridge & holder)	SS, Ceramic	ea	00950-30021	Optimize Tech
10-47-02004	—	Thermo Surveyor L Pump	OPTI-MAX Replacement Cartridges (inlet/outlet)	SS, Ruby, Sapphire	2/EA		Optimize Tech
50-48-01983	—	Thermo Surveyor L Pump	OPTI-MAX Inlet Valve Assy (cartridge & holder)	PEEK, Ceramic	ea		Optimize Tech
50-48-00893	—	Thermo Surveyor L Pump	OPTI-MAX Outlet Valve Assy (cartridge & holder)	PEEK, Ceramic	ea		Optimize Tech
10-49-02004	—	Thermo Surveyor L Pump	OPTI-MAX Repl Cartridges (inlet/outlet)	PEEK, Ruby, Sapphire	2/EA		Optimize Tech

(continued)

Replacement Pump Supplies for Thermo Scientific Instruments (cont.)

CHECK VALVES FOR THERMO SCIENTIFIC INSTRUMENTS							
PART NO	PART NO ACN COMPATIBLE	FITS MODEL	DESCRIPTION	MATERIAL	QTY	OEM PART NO	MANUFACTURER
250-1300	250-1300ACN	TSP SpectraSYSTEM 3200 Constametric	Inlet Valve Assy (cartridge & holder)		ea	900947001	ASI
250-1280	250-1280ACN	TSP SpectraSYSTEM 3200 Constametric	Repl Inlet Cartridge		ea		ASI
250-1305	250-1305ACN	TSP SpectraSYSTEM 3200 Constametric	Outlet Valve Assy (cartridge & holder) with Adapter Seal		ea	900947002	ASI
250-1285	250-1285ACN	TSP SpectraSYSTEM 3200 Constametric	Repl Outlet Cartridge		ea		ASI
250-1307-5	—	TSP SpectraSYSTEM 3200 Constametric	LDC (all analytical), Adapter Seal		5/pk		ASI
250-1210	250-1210ACN	TSP SpectraSYSTEM P-Series, 8700, 8800, 8810, IsoChrom	Inlet Valve Assy (cartridge & holder)		ea	A3495-010	ASI
250-1190	250-1190ACN	TSP SpectraSYSTEM P-Series, 8700, 8800, 8810, IsoChrom	Repl Inlet Cartridge		ea		ASI
250-1217	250-1217ACN	TSP SpectraSYSTEM P-Series	Transducer Valve Assy (cartridge & holder)		ea	A3990-010	ASI
250-1197	250-1197ACN	TSP SpectraSYSTEM P-Series	Replacement Transducer Cartridge		ea		ASI
35-56-00956	—	TSP SpectraSYSTEM P-Series, 8700, 8800, 8810, IsoChrom	OPTI-MAX Inlet Valve Assy (cartridge & holder)	SS	ea	A3495-010	Optimize Tech
35-56-00952	—	TSP SpectraSYSTEM P-Series	OPTI-MAX Transducer Valve Assy (cartridge & holder)	SS	ea	A3990-010	Optimize Tech
10-56-02004	—	TSP SpectraSYSTEM P-Series, 8700, 8800, 8810, IsoChrom	OPTI-MAX Repl Cartridges (inlet/outlet/transducer)	SS	2/EA		Optimize Tech
250-1215	250-1215ACN	8700, 8800, 8810, IsoChrom	Outlet Check Valve Assy (cartridge & holder)	SS	ea	A3490-010	ASI
250-1195	—	8700, 8800, 8810, IsoChrom	Repl Outlet Cartridge		ea		ASI
35-56-00961	—	8700, 8800, 8810, IsoChrom	Outlet Check Valve Assy (cartridge & holder)	SS	ea	A3490-010	Optimize Tech

PISTONS SEALS FOR THERMO SCIENTIFIC INSTRUMENTS							
PART NO (ea)	PART NO (10/pk)	FITS MODEL	DESCRIPTION	MATERIAL	OEM PART NO	MANUFACTURER	
50-36-00863	50-36-00864	Thermo L Pump	Piston Seal	ITB PTFE	00107-1808, 00107-18110	Optimize Tech	
50-36-00865	50-36-00866	Thermo L Pump	OPTI-SEAL Piston Seal	UHMWPE	00950-30004	Optimize Tech	
200-1280	200-1285	TSP SpectraSYSTEM 3200 Constametric	Piston Seal	UHMWPE	206234	ASI	
200-1281	200-1286	TSP SpectraSYSTEM 3200 Constametric	Piston Seal	PTFE	206234	ASI	
200-1287	—	TSP SpectraSYSTEM 3200 Constametric	Replacement Kit (Piston Seal 200-1280, Back-Up Washer, 2 Bushings, O-Ring)	UHMWPE	801892001	ASI	
200-1288	—	TSP SpectraSYSTEM 3200 Constametric	Replacement Kit (Piston Seal 200-1281, Back-Up Washer, 2 Bushings, O-Ring)	PTFE	801892001	ASI	
200-1210	200-1215	TSP SpectraSYSTEM P-Series, Spectra-Physics 8100, 8800, 8810, Isochrom	Piston Seal	UHMWPE	A2962-010, A3070-010	ASI	
200-1211	200-1212	TSP SpectraSYSTEM P-Series, Spectra-Physics 8100, 8800, 8810, Isochrom	Piston Seal	PTFE	A2962-010, A3070-010	ASI	
200-1218	200-1219	TSP SpectraSYSTEM P-Series, Spectra-Physics 8100, 8800, 8810, Isochrom	Flush Seal	UHMWPE	A2963-010	ASI	


Replacement Pump Supplies for Thermo Scientific Instruments (cont.)

PISTONS FOR THERMO SCIENTIFIC INSTRUMENTS					
PART NO	FITS MODEL	DESCRIPTION	MATERIAL	OEM PART NO	MANUFACTURER
50-34-02650	Thermo L Pump	Piston	Sapphire	00950-30020	Optimize Tech
260-1180	TSP SpectraSYSTEM 3200 Constametric	Piston	Sapphire	801306	ASI
260-1100	TSP SpectraSYSTEM P-Series	Piston	Sapphire	A3102-010	ASI
260-1105	Spectra-Physics 8100, 8700, 8800, 8810, Isochrom	Piston	Sapphire	A1593-010	ASI
260-1100	Spectra-Physics 8100, 8800, 8810, Isochrom	Piston	Sapphire	A3102-010	ASI

Replacement Detector Supplies for Thermo Scientific Instruments

LAMPS FOR THERMO SCIENTIFIC INSTRUMENTS				
PART NO	FITS MODEL	DESCRIPTION	MANUFACTURER	
L-235	Dionex Ultimate 3000 Series VDM-2	D2 Lamp	Sonntek	
LH-25	Dionex Ultimate 3000 Series ULT-UVD, UVD-3000	D2 Lamp	Sonntek	
LHA-23	Dionex Ultimate 3000 Series ULT-UVD	W Lamp	Sonntek	
L-800	Dionex Ultimate 3000 Series RF-2000	Xe Lamp	Sonntek	
LH-46	Surveyor 6057-60030, 6057-60040, SRVYR-PDA1P, 5P ACCELA, UV1P, UV6000LP	D2 Lamp	Sonntek	
L-765	Surveyor 6057-60030, 6057-60040, SRVYR-PDA1P, 5P ACCELA, UV1P, UV6000LP	W Lamp	Sonntek	
LH-40	Spectra Physics UV100, UV150, UV1000, UV2000, UV3000, UV3000HR	D2 Lamp	Sonntek	
LH-760	Spectra Physics UV100, UV150, UV1000, UV2000, UV3000, UV3000HR	W Lamp	Sonntek	

Replacement Pump Supplies for Waters Instruments

CHECK VALVES FOR WATERS INSTRUMENTS							
PART NO	PART NO ACN COMPATIBLE	FITS MODEL	DESCRIPTION	MATERIAL	QTY	OEM PART NO	MANUFACTURER
250-1497	—	Acquity UPLC	Primary Check Valve Assy with Gasket		ea	700002596	ASI
250-1498	—	Acquity UPLC	Intelligent Valve Assy with Gasket		ea	700003563	ASI
250-1499	—	Acquity UPLC	Check Valve, Double Ball & Seat with Gasket		ea	700002968	ASI
250-1060	250-1060ACN	616, Alliance 2690, 2695, 2790, 2795, 2796	Inlet Valve Assy (cartridge & holder)		ea	55845, 24960	ASI
250-1040	250-1040ACN	616, Alliance 2690, 2695, 2790, 2795, 2796	Repl Inlet Cartridge		ea		ASI
250-1065	250-1065ACN	616, Alliance 2690, 2695, 2790, 2795, 2796	Outlet Valve Assy (cartridge & holder)		ea	55844, 24960	ASI
250-1045	250-1045ACN	616, Alliance 2690, 2695, 2790, 2795, 2796	Repl Outlet Cartridge		ea		ASI
250-1070	250-1070ACN	616, Alliance 2690, 2695, 2790, 2795, 2796	Inlet /Outlet Waters Direct Repl Cartridge		ea	270941	ASI
39-46-01949	—	616, Alliance 2690, 2695, 2790, 2795, 2796	OPTI-MAX Inlet Valve Assy (cartridge & holder)	Ceramic, SS	ea	700002332	Optimize Tech 
10-46-02004	—	616, Alliance 2690, 2695, 2790, 2795, 2796	OPTI-MAX Repl Cartridge	Ceramic, SS	2/pk		Optimize Tech

Replacement Pump Supplies for Waters Instruments (cont.)

PISTON SEALS FOR WATERS INSTRUMENTS						
PART NO (ea)	PART NO (10/pk)	FITS MODEL	DESCRIPTION	MATERIAL	OEM PART NO	MANUFACTURER
200-0210	200-0215	Alliance 2690, 2695, 2790, 2795, 2796	Piston Seal	UHMWPE	WAT270938	ASI
200-0220	200-0225	Alliance 2690, 2695, 2790, 2795, 2796	Seal Wash Piston Seal	UHMWPE	WAT271018	ASI
200-0230	—	Alliance 2690, 2695, 2790, 2795, 2796	Seal Wash Face Seal	UHMWPE	WAT271017	ASI
200-0240	—	Alliance 2690, 2695, 2790, 2795, 2796	Seal Wash Tube Seal	UHMWPE	WAT270940	ASI
200-0250	—	Alliance 2690, 2695, 2790, 2795, 2796	Pump Head Face Seal	UHMWPE	WAT270939	ASI
39-36-02596	39-36-02597	Alliance 2690, 2695, 2790, 2795, 2796	OPTI-SEAL Piston Seal	UHMWPE	WAT270938	Optimize Tech
39-36-02855	—	Alliance 2690, 2695, 2790, 2795, 2796	Pump Head Face Seal, 4/pk		WAT270939	Optimize Tech
39-36-02856	—	Alliance 2690, 2695, 2790, 2795, 2796	Seal Wash Face Seal, 4/pk		WAT271017	Optimize Tech
39-36-02858	—	Alliance 2690, 2695, 2790, 2795, 2796	Seal Wash Tube Seals, 4/pk		WAT270940	Optimize Tech
39-36-02860	—	Alliance 2690, 2695, 2790, 2795, 2796	Seal Wash Piston Seal, 2/pk		WAT271018	Optimize Tech

PISTONS FOR WATERS INSTRUMENTS						
PART NO	FITS MODEL	DESCRIPTION	MATERIAL	OEM PART NO	MANUFACTURER	
260-1400	Acquity UPLC	Piston	Sapphire	700002600	ASI	
260-1245	Alliance 2690, 2695, 2790, 2795, 2796	Piston	Sapphire	WAT270959	ASI	
92-2690	Alliance 2690, 2695, 2790, 2795, 2796	Piston	Sapphire	WAT270959	Sciencix	

MISCELLANEOUS FOR WATERS INSTRUMENTS						
PART NO	FITS MODEL	DESCRIPTION	MATERIAL	OEM PART NO	MANUFACTURER	
270-0755	600	Waters 600, PM Starter Kit	UHMW	52675	ASI	
270-0765	600	Waters 600, PM Kit	UHMW	52676	ASI	
93-9600	501, 510, 590, 600, 610	Single Solvent Manifold Kit		WAT060448	Sciencix	
850-0945	Alliance Model 2690, 2695, 2790, 2795, 717, LCM 1	Replacement Insert 2 Micron Filter		WAT088084	ASI	

Replacement Detector Supplies for Waters Instruments

LAMPS FOR WATERS INSTRUMENTS						
PART NO	FITS MODEL	DESCRIPTION	OEM PART NO	MANUFACTURER		
L-770	420	Hg Lamp		Sonntek		
L-820	440, 441	Hg Lamp		Sonntek		
LHA-1	450	D2 Lamp & holder		Sonntek		
LH-1	450	D2, Replacement Cartridge Lamp, fits LHA-1		Sonntek		
L-800	470, 474	Xe Lamp		Sonntek		
39-32-03312	470, 474	Xe Lamp	WAT047447, WAT052665	Optimize Tech		
L-205	480, 481	D2 Lamp		Sonntek		
LH-30	484	D2 Lamp		Sonntek		
LH-31	486	D2 Lamp		Sonntek		
39-32-02823	486	D2 Lamp	WAT080678, 700000356	Optimize Tech		
L-890	490E	Xe Lamp		Sonntek		
LH-33	996, 2996	D2 Lamp		Sonntek		
39-32-02835	996, 2996	DoubleLife™ D2	WAT052586	Optimize Tech		
LHA-34	990, 991, 994	D2 Lamp & holder		Sonntek		
LH-34	990, 991, 994	D2, Replacement Cartridge Lamp, fits LHA-34		Sonntek		
L-120	2420, 2424 ELSD	D2 Lamp		Sonntek		
LH-925	2475	Xe Lamp		Sonntek		
LH-36X2	2487, 2488	D2 Lamp & holder		Sonntek		
39-32-02825	2487, 2488	D2 Lamp	WAS081142	Optimize Tech		

GC Accessories

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Featured Product

380 NEW! Agilent Intuvo Supplies

An innovative range of supplies and fittings makes Intuvo the most efficient, cost-effective, premium GC to own and operate. This specially-designed range of supplies includes: ferrule-free fittings, Guard Chip retention gap technology, and no-trim columns, that transform your GC experience.



Intuvo Flow Chips are fitted with smart keys, meaning Intuvo knows exactly how to set itself up, whether for splitting, backflush, GC detectors, or mass spectrometry.



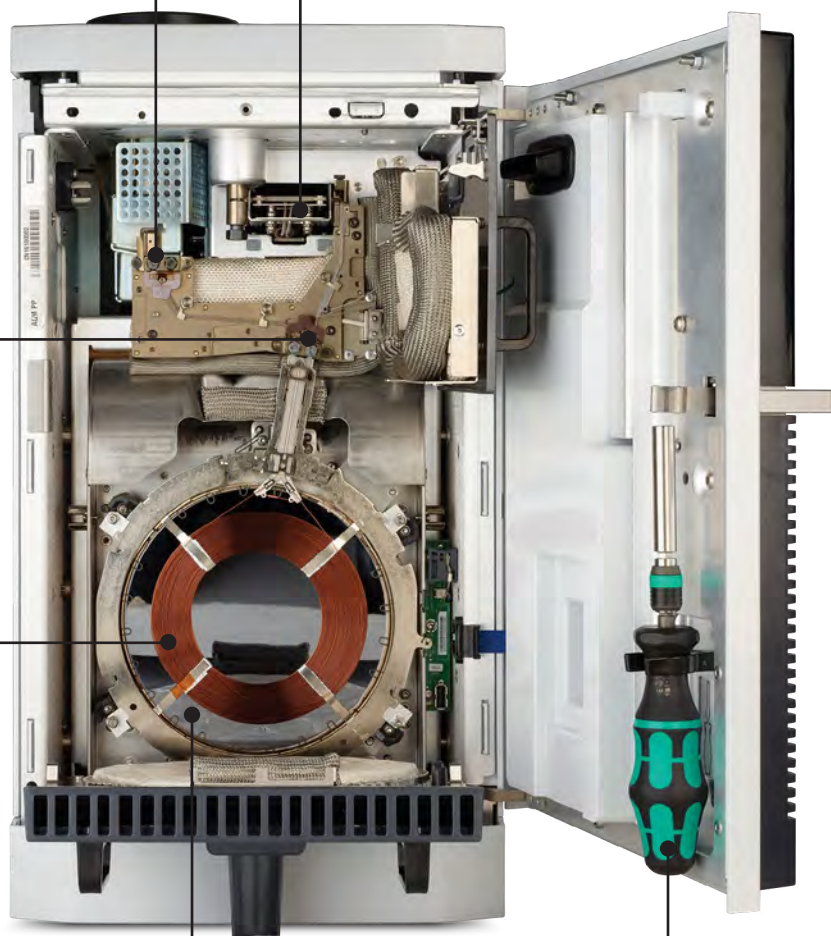
Fast Guard Chip replacement makes troublesome column trimming and associated downtime a thing of the past.



Gaskets take the place of ferrules, providing easy leak-free face seal connections for columns and detectors of the Intuvo flow path.



Intuvo columns are coated with industry proven chemistries in a revolutionary form factor. Smart keys enable immediate identification of the column configuration, temperature limits, and monitors usage.



Direct heating can save you time, and improve productivity in half the bench footprint.

The torque driver for column installation is mounted to the inside of your GC.

GC and GC/MS Maintenance Schedule

GC AND GC/MS MAINTENANCE SCHEDULE		
ITEM	TYPICAL SCHEDULE	ACTION/COMMENTS
GAS MANAGEMENT		
Gas purifiers (carrier gas and detector gas)	Every 6 to 12 months	Replacement schedule is based on capacity and grade of gas. In general, replace non-indicating traps every 6 to 12 months or when indicating traps start to change color. Replace indicating traps when indicating material is starting to change color.
Internal split vent trap	Every 6 months*	Replace to prevent material backing up into EPC control and to avoid costly repair.
External split vent trap	Every 6 months*	Replace to prevent sample analytes from escaping into the laboratory environment.
Flow meter calibration	Every 1 to 2 years	Re-calibrate electronic flow meters – follow recommended schedule for the unit (shown on the calibration certificate).
SAMPLE INTRODUCTION OF INLETS		
Syringes and/or syringe needles	Every 3 months*	Replace syringe if dirt is noticeable in the syringe. If it cannot be cleaned, if the plunger doesn't slide easily, or if clogged. Replace needle if septa wear is abnormal or the needle becomes clogged.
Inlet liner	Weekly*	Check often. Replace when dirt is visible in the liner or if chromatography is degraded.
Liner O-rings	Monthly*	Replace with every liner change.
Inlet septum	Daily*	Check often. Replace when signs of deterioration are visible (gaping holes, fragments in inlet liner, poor chromatography, low column pressure, etc.)
Inlet hardware	Every 6 months Every year	Check for leaks and clean. Check parts and replace when parts are worn, scratched, or broken.
Inlet gold or stainless steel seal	Monthly*	For highest level of reproducibility, change inlet seal with every liner change, but minimally replace monthly or when scratched, corroded, or if there is build-up of non-volatile sample components.
COLUMNS		
Front-end maintenance	Weekly-monthly*	Remove 1/2 to 1 m from the front of the column when experiencing chromatographic problems (peak tailing, decreased sensitivity, retention time changes, etc.). Replace inlet liner and septum, and clean inlet as necessary. Guard column may be useful for increasing column lifetime.
Solvent rinse	As needed	Perform when chromatography degradation is due to column contamination. Only for bonded and cross-linked phases.
Replacement	As needed	Replace when trimming and/or solvent rinsing no longer restore chromatographic performance.
Ferrules	As needed	Replace when changing columns and inlet/detector parts.
DETECTORS		
FID/NPD jets and collector	As needed	Clean when deposits are present. Replace when they become scratched, bent, or damaged, or when having difficulty lighting FID or keeping flame lit.
NPD bead	As needed	Replace when signal drifts or there is a dramatic change in sensitivity.
FID	Every 6 months	Measure hydrogen, air, and makeup gas flows.
TCD	As needed	Thermally clean by "baking-out" when a wandering baseline, increased noise, or a change in response is present. Replace when thermal cleaning does not resolve the problem.
ECD	Every 6 months or as needed	Wipe test. Thermally clean by "baking out" when baseline is noisy, or the output value is abnormally high. Replace when thermal cleaning does not resolve the problem.
FPD	Every 6 months or as needed	Measure hydrogen, air, and makeup gas flows. Clean/replace FPD windows and seals when detector sensitivity is reduced.
NCD and SCD	Every 3 months*	Change pump oil, oil coalescing filter and chemical trap.
MASS SELECTIVE DETECTORS		
Tune MSD	As needed	Keep plenty of PFTBS (P/N 05971-60571) on hand.
Check the calibration vial	Every 6 months	Vial can be refilled without venting the system.
Replace the foreline pump oil	Every 6 months	Check the fluid weekly. Change when the fluid becomes discolored or every 6 months.
Replace the diffusion pump fluid	Every year or as needed	Check the fluid weekly. Too little fluid will cause the pump to run at a higher temperature, resulting in degradation and loss of high vacuum. Change when the fluid is discolored or contains particulates.
Clean the ion source	As needed	Clean when performance deteriorates to remove contamination and to restore the electrostatic properties of the ion lens system. Replace scratched parts to maintain optimal performance.

*Schedule is an approximation of average usage requirements. Frequency may vary widely based upon application and sample type.

Agilent Bulk GC Supplies

AGILENT BULK GC SUPPLIES		
PART NO	DESCRIPTION	QTY
LINERS		
5190-3173	Ultra Inert Liner, low pressure drop, glass wool	100/pk
5190-3170	Ultra Inert Liner splitless liner, single taper, no wool	100/pk
5190-3171	Ultra Inert splitless liner, single taper, glass wool	100/pk
5190-3172	Ultra Inert split liner, straight, glass wool	100/pk
5190-2275	Single taper split liner, low pressure drop	100/pk
5190-2270	Single taper splitless liner, no wool	100/pk
5190-2271	Single taper splitless liner, glass wool	100/pk
5190-2272	Double taper splitless liner, no wool	100/pk
SEALS		
5190-2209	Certified gold plated seal kit, includes washer	10/pk
O-RINGS		
5190-2268	Non-stick fluorocarbon O-ring for Flip Top	100/pk
5190-2269	Certified non-stick fluorocarbon O-ring	100/pk
SEPTA		
5190-3157	Non-stick BTO septa, 11 mm	400/pk
5190-3158	Non-stick Advanced Green septa, 11 mm	400/pk
SILTITE FERRULE BULK PACKS		
G3188-27501	Ferrules, Siltite, 0.1 – 0.25 mm column	100/pk
G3188-27502	Ferrules, Siltite, 0.32 mm column	100/pk
G3188-27503	Ferrules, Siltite, 0.53 mm column	100/pk

→ Economical and convenient packaging, same great Agilent quality



Agilent Inlet Septa

AGILENT INLET SEPTA FOR AGILENT GC SYSTEMS					
DIAMETER	QTY	PREMIUM NON-STICK SEPTA			ECONOMICAL GENERAL PURPOSE
		NON-STICK BLEED TEMP OPTIMIZED	NON-STICK LONG LIFE	NON-STICK ADVANCED GREEN	
11 mm	50/pk	5183-4757	5183-4761	5183-4759	5080-8896-50
11 mm	100/pk	5183-4757-100	5183-4761-100	5183-4759-100	5080-8894-100
11 mm	400/pk	5190-3157	—	5190-3158	—
SUMMARY OF PREMIUM INLET SEPTA CHARACTERISTICS					
Bleed		✓✓✓	✓	✓✓	
Lifetime		✓	✓✓✓	✓✓	
Temp Limits		to 400 °C inj port	to 350 °C	to 350 °C	to 350 °C

Premium Non-Stick Septa





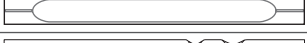



- Proprietary plasma treatment prevents sticking and unnecessary inlet cleaning
- Innovative blister packaging – each septum is clean and ready for use
- Center point guides the needle for easy penetration, less coring and longer life



AGILENT CROSSLAB INLET SEPTA FOR OTHER GC SYSTEMS					
DIAMETER	QTY	PREMIUM NON-STICK SEPTA			ECONOMICAL GENERAL PURPOSE
		NON-STICK BLEED TEMP OPTIMIZED	NON-STICK LONG LIFE	NON-STICK ADVANCED GREEN	
17 mm	24/pk	8010-0229	8010-0245	8010-0213	8010-0261
17 mm	48/pk	8010-0230	8010-0246	8010-0214	8010-0262
for Shimadzu	50/pk	8010-0231	—	8010-0215	8010-0263
for Shimadzu	100/pk	8010-0232	—	8010-0216	8010-0264

Agilent Inlet Liners




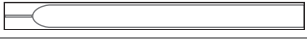





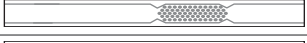



Agilent Ultra Inert Inlet Liners

AGILENT ULTRA INERT LINERS							
DESCRIPTION		VOLUME (μL)	ID (mm)	EA	5/PK	25/PK	100/PK*
SPLIT INLET LINERS							
	Low pressure drop, Ultra Inert Liner w/glass wool	870	4	5190-2295	5190-3165	5190-3169	5190-3173
	Straight, Ultra Inert Liner with glass wool	990	4	5190-2294	5190-3164	5190-3168	5190-3172
SPLITLESS INLET LINERS							
	Single taper, Ultra Inert Liner	900	4	5190-2292	5190-3162	5190-3166	5190-3170
	Single taper, Ultra Inert Liner with glass wool	900	4	5190-2293	5190-3163	5190-3167	5190-3171
	Splitless, double taper Ultra Inert Liner, no wool	800	4	5190-3983	5190-4007	—	—
	Dimpled, splitless, Ultra Inert Liner	200	2	5190-2297	5190-4006	—	—
	Straight, Ultra Inert Liner		1	5190-4047	—	—	—
	Straight Ultra Inert Liner for SPME		0.75	5190-4048	—	—	—

*The 100/pk is not in the Touchless packaging. O-rings must be purchased separately.

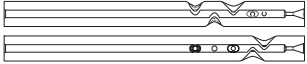
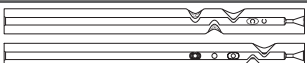




TECH TIP Agilent's Ultra Inert GC liners are delivered in Touchless packaging with a certified, non-stick o-ring pre-installed. Now you can quickly and easily install the new, clean liner – without searching for the o-ring pack or risking contamination from touching.

Agilent Original Deactivation Split & Splitless Liners

AGILENT ORIGINAL DEACTIVATION SPLIT & SPLITLESS LINERS							
DESCRIPTION		VOLUME (μL)	ID (mm)	EA	5/PK	25/PK	100/PK
SINGLE TAPER SPLIT LINERS							
	Single taper glass wool, deactivated, low pressure drop	870	4	5183-4647	5183-4701	5183-4702	5190-2275
	Single taper, glass wool, deactivated	870	4	5183-4711	5183-4712	5183-4713	—
SINGLE TAPER SPLITLESS LINERS							
	Single taper, deactivated	900	4	5181-3316	5183-4695	5183-4696	5190-2270
	Single taper, inert	900	4	5181-3316i	—	—	—
	Single taper, glass wool, deactivated	900	4	5062-3587	5183-4693	5183-4694	5190-2271
STRAIGHT SPLIT LINERS							
	Straight, glass wool, non-deactivated	990	4	19251-60540	5183-4691	5183-4692	—
STRAIGHT SPLITLESS LINERS							
	Straight, deactivated, quartz	250	2	5181-8818	5183-4703	5183-4704	—
	Straight, non-deactivated, quartz	250	2	18740-80220	5183-4707	5183-4708	—
	Straight, non-deactivated	990	4	210-3003	210-3003-5	—	—
FOCUS SPLIT LINERS							
	Deactivated with glass wool	935	4	—	210-4004-5	—	—
	Tapered, deactivated with glass wool	880	4	—	210-4022-5	—	—
DOUBLE TAPER SPLITLESS LINERS							
	Double taper, deactivated	800	4	5181-3315	5183-4705	5183-4706	5190-2272
DIRECT INLET SPLITLESS LINERS							
	Straight, non-deactivated (for gas samples, headspace, or purge & trap)	140	1.5	18740-80200	5183-4709	5183-4710	—

Agilent Specialty Injection Liners


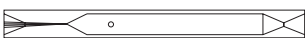

Agilent MultiMode Inlet Heavy Matrix Injection Liners

AGILENT MULTIMODE INLET HEAVY MATRIX						
DESCRIPTION		VOLUME (μL)	ID (mm)	EA	5/PK	25/PK
DIMPLED						
 Dimpled splitless single taper, deactivated		200	2	5190-2296	—	—
ULTRA INERT DEACTIVATED DIMPLED LINERS						
 Dimpled, splitless, Ultra Inert Liner		200	2	5190-2297	5190-4006	—
MANUAL INJECTION						
 Straight, with cup (for manual injections)		800	4	18740-80190	5183-4699	5183-4700
 Straight split liner with cup, glass wool, and packing, 18740-60840		800	4	18740-60840	5183-4697	5183-4698
SPME						
 SPME, Ultra Inert deactivation		70	0.75	5190-4048	—	—
VOLATILES						
 Volatiles Organic Analysis liner		1		5190-4047	—	—

Agilent Programmed Temperature Vaporization (PTV) Liners

AGILENT PROGRAMMED TEMPERATURE VAPORIZATION (PTV) LINERS			
DESCRIPTION	VOLUME (μL)	ID (mm)	PART NO
PTV LINERS			
PTV liner, single baffle, glass wool, deactivated	180	2	5183-2038
PTV liner, single baffle, deactivated	200	2	5183-2036
PTV liner, multi baffled, deactivated	150	1.8	5183-2037
PTV liner, sintered glass, deactivated	112	1.5	5190-1426
LINERS FOR HIGH TEMPERATURE PTV INLET, G3506A			
PTV liner, high temperature, quartz	713	3.4	5188-5313
PTV liner, high temperature, borosilicate	668	3.4	5188-5356

Agilent Programmed Temperature Vaporization (PTV) Liners

AGILENT DIRECT CONNECT			
DESCRIPTION		ID (mm)	PART NO
 Direct Connect Liner, single taper, deact		4	G1544-80730
 Dual taper direct connect liner, splitless, Agilent proprietary deactivation		4	G1544-80700
 Direct Connect Liner, single taper, deact		4	G1544-80730

Agilent Gold Seals for Split/Splitless Inlets

AGILENT SPLIT/SPLITLESS INLET SEALS			
DESCRIPTION	EA	10/PK	50/PK
Certified gold plated seal kit, includes washer	5188-5367	5190-2209	—
Gold plated seal with cross*	5182-9652	—	—
Stainless steel seal	18740-20880	—	—
Ultra Inert gold seal & washer	5190-6144	5190-6145	5190-6149

*Use with total flow rates above 200 mL/min

5188-5367



5190-2209



Agilent Liner O-Rings

AGILENT LINER O-RINGS		
DESCRIPTION	QTY	PART NO
Certified non-stick fluorocarbon O-ring	10/pk	5188-5365
	100/pk	5190-2269
Graphite O-ring for splitless liner	10/pk	5180-4173
Graphite O-ring for split liner	10/pk	5180-4168
Non-stick fluorocarbon liner O-ring for Flip Top	10/pk	5188-5366
	100/pk	5190-2268
High temperature PTV inlet liner fluorocarbon O-ring	10/pk	5188-5311

5190-2269



TECH TIP Packaged for convenience and cleanliness in a novel dial package that delivers 1 clean o-ring at a time.

Agilent Capillary Column Ferrules and Nuts

AGILENT CAPILLARY COLUMN FERRULES—FOR USE WITH THE MOST BRANDS OF COLUMN, INCLUDING DB AND HP COLUMNS (10/PK)							
COLUMN ID (mm)	FITS AGILENT BRAND COLUMN SERIES	FERRULE NOMINAL ID	SHORT FERRULE GRAPHITE	SHORT FERRULE VESPEL	SHORT FERRULE 85% VESPEL/ 15% GRAPHITE	PRE-CONDITIONED LONG FERRULE 85% GRAPHITE/ 15% VESPEL	ULTIMETAL PLUS FLEXIBLE METAL FERRULE
0.1 – 0.25	DB, HP	0.4	500-2114	5181-3322	5181-3323	5062-3508	G3188-27501
0.32	DB, HP	0.5	5080-8853	5062-3513	5062-3514	5062-3506	G3188-27502
0.45 – 0.53	DB, HP	0.8	500-2118	5062-3511	5062-3512	5062-3538	G3188-27503
No hole			—	—	5190-4054	5181-3308	—
CAPILLARY COLUMN FERRULES – FOR USE WITH CP, VF AND SELECT COLUMNS							
0.025-0.05	CP, VF, Select	0.4	500-2114	5062-3515	5062-3516	5062-3507	—
0.075	CP, VF, Select	0.4	500-2114	5062-3515	5062-3516	5062-3507	—
0.1-0.25	CP, VF, Select	0.5	5080-8853	5062-3513	5062-3514	5062-3508	—
0.32	CP, VF, Select	0.5	5080-8853	5062-3513	5062-3514	5062-3508	—
	CP-silica PLOT	0.8	500-2118	5062-3511	5062-3512	5062-3538	—
0.53	CP, VF, Select	0.8	500-2118	5062-3511	5062-3512	5062-3538	—
No hole			—	—	5190-4054	5181-3308	—

AGILENT COLUMN NUTS	
DESCRIPTION	PART NO
SHORT NUTS	
Universal column nut, 1/16" hex, 2/pk	5181-8830
Blanking plug, finger tight style	5020-8294
6850 column nut, 2/pk	5183-4732
High Temperature SimDis PTV inlet, 4 mm hex	5188-5312
LONG NUTS	
MS interface column nut, female, (requires long ferrule)	05988-20066
Column nut for long or long two-hole ferrules	05921-21170
ACCESSORIES	
Open end wrench, 1/4" and 5/16"	8710-0510
SELF TIGHTENING COLUMN NUT (USES SHORT FERRULE)	
Self Tightening Column nut, Inlet/Detector	5190-6194
Self Tightening Column nut, MSD	5190-5233

UltiMetal Plus Flexible Metal Ferrule



- Grips capillary tubing for proper seal without over tightening
- Highly inert for your trace-level analysis
- Robust, leak-free column connection

Self Tightening Column Nut



- Leak-free seal, even at high temperatures
- Easy finger-tight design—no retightening needed
- Use with *short* graphite/polyimide ferrules
- Available for the inlet, detector and the MS transfer line

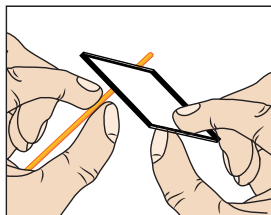
Agilent Ultra Inert Press Fits

In the past it was necessary to use press-fit connectors with specific dimensions to connect columns of those dimensions. The new **universal design** means that you no longer have to choose a specific column dimension for the Press Fit. The taper of the Ultra Inert Press Fits allows for multiple column dimensions.

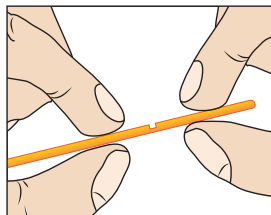
Modern press-fit connectors are "laser-milled" to provide highly reproducible taper angles throughout the length of the press-fit, ensuring an excellent seal. The press-fits are now treated with Agilent Ultra Inert deactivation to provide a robust and inert flow path.

The new Ultra Inert Press Fit containers have batch certification of inertness, easier to use instructions, and improved packaging to ensure your product arrives intact.

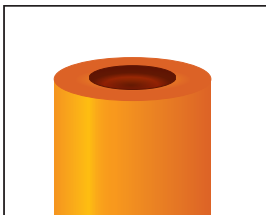
DESCRIPTION	QTY	PART NO
Resin, Capillary Sealing, 5 grams—Dangerous Good	ea	500-1200
Y-splitter, Ultra Inert, universal press fit	ea	5190-6980
Universal Press Fit Union, Ultra Inert, for 0.10 – 0.75 mm	10/pk	5190-6979



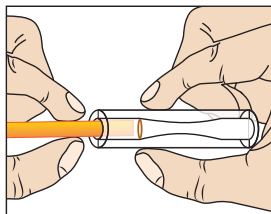
Step 1
Lightly scribe column with wafer cutter (p/n 5181-8836)



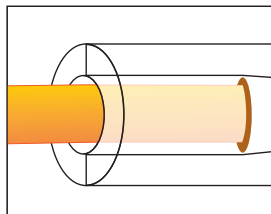
Step 2
Gently break column apart



Step 3
Inspect column end for clean, smooth cut using magnifier (p/n 430-1020)



Step 4
Grasp column near end and insert column into Press Fit. Push the two straight together firmly.



Step 5
Inspect connection, using the magnifier. A brown ring completely around the end of the column indicates a leak free seal. A tug on the column/union will assure an accurate connection. Though not required, you may also install your capillary columns using polyimide sealing resin. Check union for leaks before and after thermal cycling.

5190-6979
Universal Press Fit Union



5190-6980
Y-splitter



Agilent Self Tightening GC Column Nut & GC Chromatography Supplies

Maintain the validity of your results with Agilent GC connection supplies.

UltiMetal Plus Flexible Metal Ferrule



- Grips capillary tubing for proper seal without over tightening
- Highly inert for your trace-level analysis
- Robust, leak-free column connection

Column Installation Pre-Swaging Tools

- Optimize GC performance and reproducibility by ensuring a proper length of column into the fittings, time after time
- Available for Agilent GC models 7890 and 6890, for graphite or metal ferrules



Self Tightening Column Nut



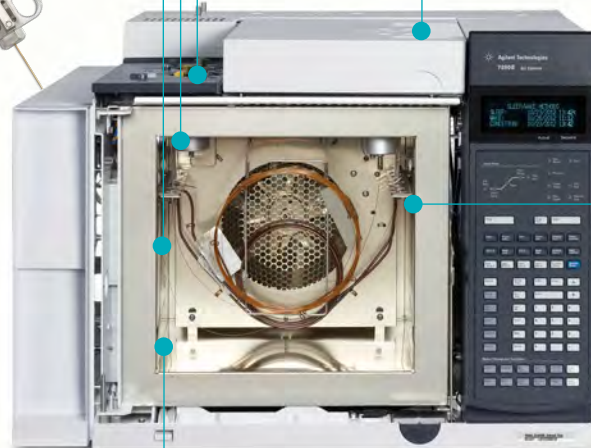
- Leak-free seal, even at high temperatures
- Easy finger-tight design—no retightening needed
- Use with *short* graphite/polyimide ferrules
- Available for the inlet, detector and the MS transfer line

UltiMetal Plus Deactivated Metal Tubing and Valves

- Improves peak shapes for active compounds
- Ensures your entire chromatographic solution is inert and corrosion resistant

UltiMetal Plus Deactivated Stainless Steel Transfer Lines and Capillary Tubing

- Provides high inertness performance
- Stainless steel transfer line tubing, capillary guard column and retention gap tubing available in 0.25, 0.32, and 0.53 mm ID



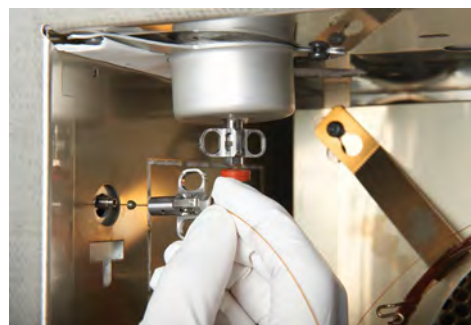
UltiMetal Plus Ultimate Union/UltiMetal Plus Tee

- Deactivated with UltiMetal Plus
- Leak-free connection of guard columns or retention gaps
- Saves money by allowing you to replace columns less frequently
- Completes Inert Flow Path with UltiMetal Plus Flexible Metal Ferrules

Self-Tightening Column Nut or Flexible Metal Ferrule: Which is right for your application?

If you need...	Self Tightening Column Nut with graphite/polyimide ferrule	UltiMetal Plus Flexible Metal ferrule
Ease of use	●	
Inertness		●
Compatibility with installed or older hardware	●	
A leak-free seal at high temperatures (above 350 °C)		●
Capillary Flow Technology Device connection		●
Pre-swaging connections for precise height into fitting		●
Re-use of the ferrule	●	
MS interface	●	

DESCRIPTION		QTY	PART NO
UltiMetal Plus Flexible Metal Ferrule	For 0.1 – 0.25 mm columns	10/pk	G3188-27501
	For 0.32 mm columns	10/pk	G3188-27502
	For 0.45 – 0.53 mm columns	10/pk	G3188-27503
Self Tightening Column Nut	Self Tightening Column nut, MSD	ea	5190-5233
	Self Tightening Column nut, Inlet/Detector	ea	5190-6194
<i>The Self Tightening GC Column nut uses the short ferrule for both the inlet and MS</i>	Short graphite/polyimide ferrules		
	.01 – 0.25 mm columns	10/pk	5181-3323
	0.32 mm columns	10/pk	5062-3514
	0.45 and 0.53 mm columns	10/pk	5062-3512
UltiMetal Plus Ultimate Union/ UltiMetal Plus Tee	Ultimate Union, deactivated	ea	G3182-61580
	Inert Tee	ea	G3184-60065
Column Installation Pre-Swaging Tools	Graphite ferrule	ea	G3440-80217
	Metal ferrule	ea	G3440-80218



The Agilent Self Tightening GC Column Nut eliminates the need for retightening once and for all.

AGILENT ULTIMETAL PLUS DEACTIVATED STAINLESS STEEL TUBING AND FITTINGS

DESCRIPTION	QTY	PART NO
1/16" x 1.0 mm UltiMetal Plus tubing, 10 m	ea	5190-6983
1/8" x 2.1 mm UltiMetal Plus tubing, 10 m	ea	5190-6984
1/4" x 4.3 mm UltiMetal Plus tubing, 5 m	ea	5190-6985
1/16" UltiMetal Plus nuts, front and back ferrule set	10/pk	5190-6986
1/8" UltiMetal Plus nuts, front and back ferrule set	20/pk	5190-6987
1/4" UltiMetal Plus nuts, front and back ferrule set	20/pk	5190-6988
1/16" UltiMetal Plus Tee	ea	5190-6989
1/8" UltiMetal Plus Tee	ea	5190-6990
1/4" UltiMetal Plus Tee	ea	5190-6991
1/16" UltiMetal Plus Union	ea	5190-6992
1/8" UltiMetal Plus Union	ea	5190-6993
1/4" UltiMetal Plus Union	ea	5190-6994
1/16" Inert tube 0.031 ID x 560 mm	ea	5190-6951
1/16" Inert Valco nut	10/pk	5190-6949
1/16" Inert Valco tee	ea	5190-6953
1/16" Inert Valco union	ea	5190-6952
1/16" Inert Valco ferrule	10/pk	5190-6950

AGILENT ULTIMETAL PLUS DEACTIVATED STAINLESS STEEL TRANSFER LINES, CAPILLARY TUBING, AND GUARD COLUMNS

PRODUCT TYPE	DESCRIPTION	PART NO
Transfer line 1/16" OD	UM Plus transfer line 2 m x 0.25 mm ID	CP6571
	UM Plus transfer line 10 m x 0.25 mm ID	CP6572
	UM Plus transfer line 2 m x 0.75 mm ID	CP6573
	UM Plus transfer line 10 m x 0.75 mm ID	CP6574
Guard columns	UltiMetal Plus Guard Column 2 m x 0.25 mm	CP6575
	UltiMetal Plus Guard Column 2 m x 0.53 mm	CP6576
	UltiMetal Plus Guard Column 5 m x 0.53 mm	CP6577
	UltiMetal Plus Guard Column 10 m x 0.53 mm	CP6578
Tubing	UltiMetal Plus tubing 50 m x 0.25 mm ID	CP6579
	UltiMetal Plus tubing 50 x 0.32 mm ID	CP6580
	UltiMetal Plus tubing 50 m x 0.53 mm ID	CP6581



5190-6194 Agilent Self Tightening GC Column Nut for Agilent inlet and detector.



5190-5233 Agilent Self Tightening GC Column Nut for Agilent MS transfer line.

This unique, self-tightening stainless steel GC column nut delivers a tight connection—without expensive upgrades or adaptors—and gives you the advantages of:

- ➔ **Reliable performance:** An innovative spring-driven piston continuously presses against the short graphite/polyimide ferrule—maintaining a leak-free seal even after hundreds of injections.
- ➔ **Less wasted time:** No need to retighten after repeated thermal cycles.
- ➔ **Ease of use:** Finger-tight design lets anyone in your lab make consistent connections reliably *without tools*.

Agilent 7890B/7890A/6890 GC Supplies Quick Pick

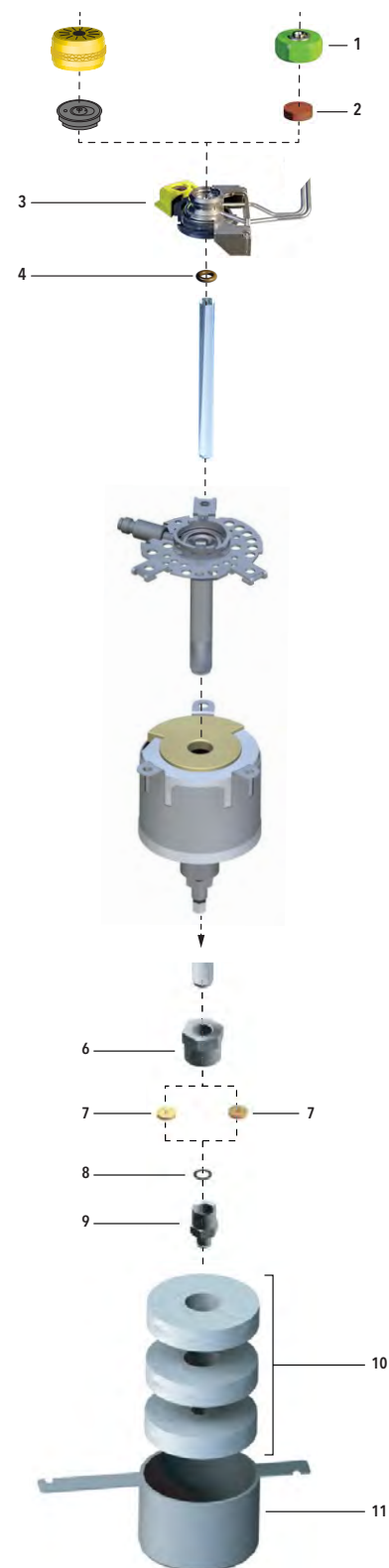
AGILENT QUICK REFERENCE GUIDE			
DESCRIPTION			PART NO
COLUMN INSTALLATION SUPPLIES			
Universal column nut			5181-8830
FERRULES, 10/PK	FERRULE ID (mm)	COLUMN ID (mm)	
Graphite	0.5	0.1, 0.2, 0.25, 0.32	5080-8853
Graphite	1.0	0.53	5080-8773
Vespel/Graphite	0.4	0.1, 0.2, 0.25	5181-3323
Vespel/Graphite	0.5	0.32	5062-3514
Vespel/Graphite	0.8	0.45, 0.53	5062-3512
Column ferrule installation tool			19251-80680
Diamond-tipped column cutting pencil			420-1000
INLET SEPTA			
11 mm Non-Stick BTO septa, 50/pk			5183-4757
11 mm Advanced green septa, 50/pk			5183-4759
11 mm Long Life Inlet septa, 50/pk			5183-4761
5 mm through hole septa, 24/pk			5181-1260
5 mm Long Life Inlet septa, 50/pk			5183-4762
High Pressure Merlin Microseal			5182-3442
Merlin Microseal, seal only			5182-3444
SPLIT/SPLITLESS INLET SUPPLIES			
Liner, split, straight, glass wool, non-deactivated			19251-60540
Splitless, single taper, deactivated, 4 mm ID			5181-3316
Liner, splitless, single-taper, glass wool, deactivated			5062-3587
Split, single taper, low pressure drop, glass wool			5183-4647
Non-Stick Fluorocarbon O-ring, 10/pk			5188-5365
Non-Stick Fluorocarbon O-ring for Flip Top, 10/pk, 6890 only			5188-5366
Gold plated seal kit			5188-5367
COOL ON-COLUMN INLET SUPPLIES			
PCOC 530um Septum Nut			G1545-80530
Spring			19245-60760
INSERTS			
For 200 µm columns, 1 ring			19245-20510
For 250 µm columns, 6 rings			19245-20515
For 320 µm columns, 5 rings			19245-20525
Inserts for capillary columns			19245-20580
PACKED COLUMN INLET SUPPLIES			
O-ring, Fluorocarbon, 12/pk			5080-8898
Ferrule, 1/4" Vespel			5080-8774
1/4" nut, brass, 10/pk			5180-4105
Disposable glass liner, 170 µL internal volume			5080-8732

AGILENT QUICK REFERENCE GUIDE	
DESCRIPTION	PART NO
FLAME IONIZATION DETECTOR (FID) SUPPLIES	
Igniter glow plug assembly	19231-60680
Blanking plug, finger-tight style	5020-8294
FID collector assembly	G1531-60690
High-temperature jet, SimDis 0.018" ID tip	G1531-80620
Jet, 0.011"/0.29 mm ID tip, capillary dedicated	19244-80560
Jet, packed standard 0.018" ID tip	18710-20119
FID flow measuring insert	19301-60660
FID cleaning kit	9301-0985
NITROGEN PHOSPHORUS DETECTOR (NPD) SUPPLIES	
NPD white ceramic bead assembly	G1534-60570
NPD black ceramic bead assembly	5183-2007
Jet, 0.011"/0.29 mm ID tip, capillary dedicated	G1531-80560
Jet, 0.011" ID tip, capillary adaptable	19244-80560
FID AND NPD ADAPTERS	
FID/NPD adapter for capillary column	19244-80610
Ferrule, 1/4" Vespel	5080-8774
530 µm, 1.0 mm ID graphite ferrule	5080-8773
320 µm, 0.5 mm ID graphite ferrule	5080-8853
1/4" nut, brass	5180-4105
THERMAL CONDUCTIVITY DETECTOR (TCD) SUPPLIES	
TCD Capillary Column Adapter	G1532-80540
ELECTRON CAPTURE DETECTOR (ECD) SUPPLIES	
Micro ECD wipe test kit	18713-60050
TOOLS	
GC Installation Kit with Gas Purifiers (no tools)	19199N
GC Installation Kit with Tools (no gas purifiers)	19199M
General laboratory tool kit	5180-4160
Injection Port Cleaning Kit	480-0003
GAS MANAGEMENT SUPPLIES	
CGA 580, 125 PSI max (8.6 bar), He, Ar, N ₂	5183-4644
OT3 Trap	OT3-2
Hydrocarbon S-Trap, 1/8" fittings	5060-9096
Moisture S-trap, preconditioned, 1/8" fittings	5060-9084
CAPILLARY FLOW TECHNOLOGY SUPPLIES	
Ultimate Union kit, deactivated	G3182-61580
Internal nut	G2855-20530
Swaging nut	G2855-20555
Column storage fitting	G2855-20590
Fused silica, deactivated, 0.15 mm x 1 m	160-2625-1
Fused silica, deactivated, 0.15 mm x 5 m	160-2625-5
Fused silica, deactivated, 0.15 mm x 10 m	160-2625-10
Ferrule, flexi inert 0.25mm col 10/pk	G3188-27501
Ferrule, flexi, inert 0.32mm col 10/pk	G3188-27502
Ferrule, flexi, inert 0.53mm col 10/pk	G3188-27503

Agilent 7890/6890/6850 Split/Splitless Inlet Supplies

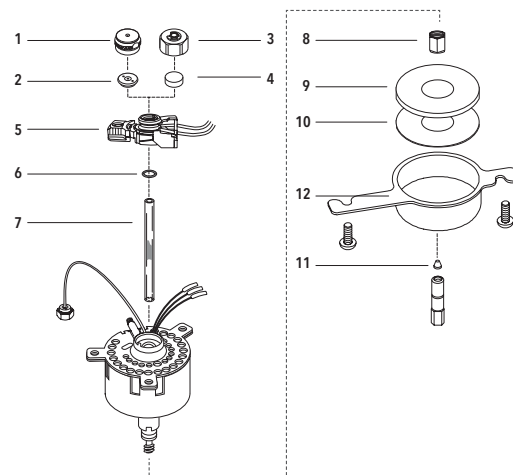
AGILENT 7890/6890/6850 SPLIT/SPLITLESS INLET SUPPLIES				
ITEM	DESCRIPTION	QTY	PART NO	
1	Headspace septum retainer nut	ea	18740-60830	
	Septum retainer nut	ea	18740-60835	
	Strain relief septum nut	ea	301-205-HSP	
2	11 mm Certified BTO septa	50/pk	5183-4757	
3	7890 Insert Weldment			
	Top insert weldment assembly, standard	ea	G3452-60730	
	Top insert assembly, valve	ea	G3480-67585	
6890 Insert Weldment	S/SL insert weldment; Used with large charcoal canister type filter, for 6890/6850	ea	G1544-60585	
	S/SL insert assembly for G1540A with valved system option; Uses the large charcoal canister split vent filter, for 6890/6850	ea	G1580-60585	
	Similar to G1544-60575 except carrier lines separated for interface to valved systems of a G1540A instrument	ea	G1580-60575	
	Original standard EPC using 1/4" split vent filter	ea	G1544-60575	
	Similar to G1544-60575 except allows insertion of 1/4" chemical filters to clean carrier gas for ECD operation	ea	G1544-80580	
	Insert Weldment Standard manual pneumatics	ea	19251-60575	
	4	Certified non-stick fluorocarbon O-ring	10/pk	5188-5365
	Graphite O-ring for split liner	10/pk	5180-4168	
	Graphite O-ring for splitless liner	10/pk	5180-4173	
	Non-stick fluorocarbon liner O-ring for Flip Top	10/pk	5188-5366	
5	Split vent rap kit	ea	G1544-60610	
	Repl cartridge (2) cartridges and (4) O-rings	ea	G1544-80530	
	Split vent trap Pm kit (1) cartridge & (2) O-rings	ea	5188-6495	
6	Retaining nut	ea	G1544-20590	
7	Stainless steel seal	ea	18740-20880	
	Certified gold plated seal kit, includes washer	ea	5188-5367	
	Gold plated seal with cross	ea	5182-9652	
8	Washers, 0.375 OD	12/pk	5061-5869	
9	Reducing nut	ea	18740-20800	
10	Insulation kit, 3 pieces	ea	5188-5241	
11	Lower insulation cover	ea	19243-00070	
12	Ferrules (see pg 368)			
	13	Universal column nut	2/pk	5181-8830
	6850 column nut	2/pk	5183-4732	
	Split/splitless septum nut angled wrench	ea	19251-00100	

18740-20800



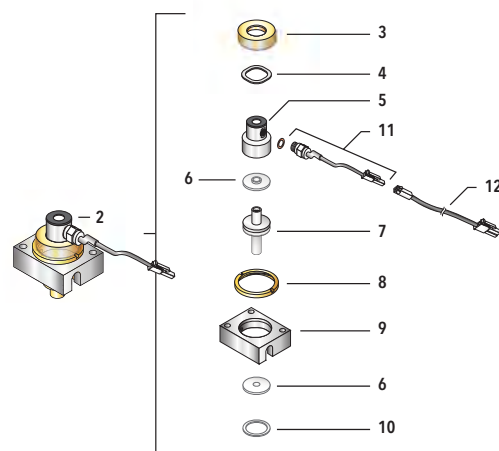
Agilent 7890 Multimode Inlet Supplies

AGILENT MULTIMODE INLET BODY		
ITEM	DESCRIPTION	PART NO
1	Merlin cap	5182-3445
2	Merlin Microseal	5182-3444
3	Septum retainer nut	18740-60835
4	11 mm Certified BTO septa 50/pk, for more septa, turn to page 365	5183-4757
5	Top insert assembly, standard	G3452-60730
6	Certified non-stick fluorocarbon O-ring	5188-5365
7	Dimpled splitless single taper, deactivated	5190-2296
8	Column nut adapter	G3510-20018
9	Foil (LN ₂ only)	—
10	Multimode Inlet insulation	—
11	Ferrule, for complete offering of ferrules, turn to page 368	—



Agilent 7890/6890/6850 Flame Ionization Detector (FID) Supplies

AGILENT 7890/6890/6850 FLAME IONIZATION DETECTOR (FID) SUPPLIES			
ITEM	DESCRIPTION	QTY	PART NO
	PTFE chimney (optional)	ea	19231-21050
2	FID collector assembly	ea	G1531-60690
	FID collector cleaning brush	2/pk	8710-1346
	FID retainer nut wrench 5880, 5890, 6890	ea	19301-00150
	1/4" nut driver for FID jet, drilled shaft	ea	8710-1561
3	Collector nut	ea	19231-20940
4	Spring washer	10/pk	5181-3311
5	Igniter castle	ea	19231-20910
	Hastelloy igniter castle (optional)	ea	19231-21060
6	Collector insulator	ea	G1531-20700
7	Collector body	ea	G1531-20690
	Hastelloy collector body	ea	G1531-21090
8	FID igniter cable for 6890/6850 only	ea	G1531-60680
9	Collector mount	—	—
10	Silicone gaskets, 0.890" OD/0.709" ID	12/pk	5180-4165
11	Igniter glow plug assembly	ea	19231-60680
12	FID igniter cable, 7890A only	ea	G3431-60680



AGILENT FID JETS			
DESCRIPTION	JET TIP ID	LENGTH	PART NO
JETS FOR CAPILLARY OPTIMIZED FITTINGS			
Capillary	0.011" (0.29 mm)	42.8 mm	G1531-80560
Capillary—Optimized for simulated distillation	0.018" (0.47 mm)	42.8 mm	G1531-80620
JETS FOR ADAPTABLE FITTINGS			
Capillary	0.011" (0.29 mm)	61.5 mm	19244-80560
Capillary—Optimized for simulated distillation	0.018" (0.47 mm)	61.5 mm	19244-80620
Packed	0.018" (0.46 mm)	63.5 mm	18710-20119
Packed, wide-bore—Use w/high-bleed applications	0.030" (0.76 mm)	63.5 mm	18789-80070



Agilent 7697A Headspace Sampler Supplies

AGILENT 7697A HEADSPACE REPLACEMENT PARTS AND SUPPLIES		
DESCRIPTION	PART NO	
Tray vial racks	G4556-60019	
Vial rack label	G4556-90500	
Universal/external split vent trap with 3 cartridges, 1/8" Swagelok fitting	RDT-1020	
Leak test kit Includes instruction sheet, no-hole ferrule, 1/8" nylon tube fitting plug, headspace leak test vial, 1/16" stainless steel ZDV plug, 11 mm low bleed septa (5/pk)	G4556-67010	
7697A Sample Probe, Deactivated	G4556-60125	
Sample probe, deactivated SN 2000	G4556-60125	
SAMPLING LOOPS, SN 2000		
DESCRIPTION	SN 1030	SN 2000
Sample loop, Headspace 0.025 mL, inert	G4556-80101	G4556-80101
Sample loop, Headspace 0.05 mL, inert	G4556-80102	G4556-80102
Sample loop, Headspace 0.10 mL, inert	G4556-80103	G4556-80103
Sample loop, Headspace 0.50 mL, inert	G4556-80105	G4556-80105
Sample loop, Headspace 1.00 mL, inert	G4556-80106	G4556-80106
Sample loop, Headspace 3.00 mL, inert	G4556-80108	G4556-80109
Sample loop, Headspace 5.00 mL, inert	G4556-80109	G4556-80108
CERTIFIED SAMPLE LOOPS*		
Certified sample loop, 1.00 mL	—	G4556-80126
Certified sample loop, 3.00 mL	—	G4556-80128
VIALS & CAPS FOR 7697A		
DESCRIPTION	QTY	PART NO
Vial kit 20 mL Headspace crimp top, flat bottom vials, silver aluminum one-piece crime caps with safety feature, PTFE/white silicone septa	100/pk	5182-0840
Headspace crimp top, flat bottom vials, 10 mL	100/pk	5182-0838
Headspace crimp top, flat bottom vials, 20 mL	100/pk	5182-0837
Silver aluminum crimp caps with 20 mm, PTFE/silicone septa	100/pk	5183-4477
20 mm electronic crimper w/lithium battery	ea	5190-3189
Ergonomic manual crimper for 20 mm caps	ea	5040-4669



7697A Headspace Sampler



5182-0837



5183-4477



5040-4669

*Certified sample loops are validated by Micro Precision Calibration, Inc and come with a calibration certificate. Loops can be recertified yearly by contacting Micro Precision directly at +1 (530) 268 1860.

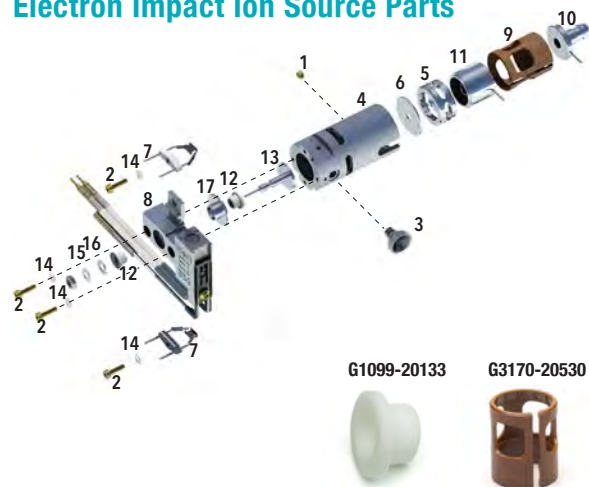
Agilent Mass Spectrometer Supplies

AGILENT ELECTRON IMPACT (EI) ION SOURCE

ITEM	DESCRIPTION	SS SOURCE	INERT SOURCE
2	Cap screw, gold plated	G1999-20021	G1999-20021
3	Transfer line socket	G1099-20136	G1099-20136
4	Inert ion source body	G1099-20130	G2589-20043
5	Drawout cylinder	G1072-20008	G1072-20008
6	Drawout plate, 3 mm	05971-20134	G2589-20100
	Drawout plate, 6 mm	G3163-20530	G2589-20045
7	Filament assembly, high temperature (EI)	G7005-60061	G7005-60061
9	Lens insulator	G3170-20530	G3170-20530
10	Entrance lens assembly	G3170-20126	G3170-20126
11	Ion focus lens	05971-20143	05971-20143
12	Repeller insulator	G1099-20133	G1099-20133
13	Repeller	G1099-20132	G2589-20044

5977/5975/5973 MSD

Electron Impact Ion Source Parts

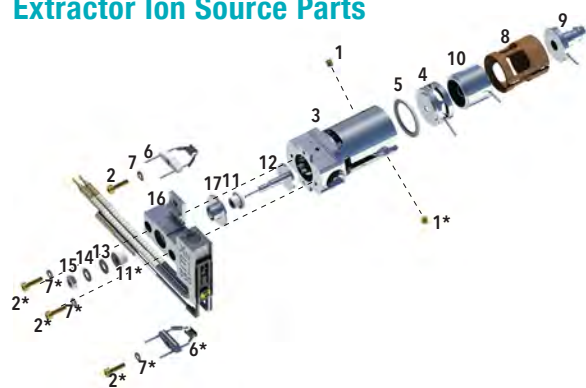


AGILENT 5977/7000C EXTRACTOR ION SOURCE PARTS

ITEM	DESCRIPTION	PART NO
3	Extraction source body	G3870-20440
4	Extractor lens	G3870-20444
5	Extractor lens insulator	G3870-20445
6	Filaments, 4-turn	G7005-60061
8	Lens insulator	G3870-20530
9	Entrance lens assembly	G3170-20126
10	Ion focus lens	05971-20143
11	Repeller insulator	G1099-20133
12	Inert repeller	G2589-20044

5977/7000C

Extractor Ion Source Parts

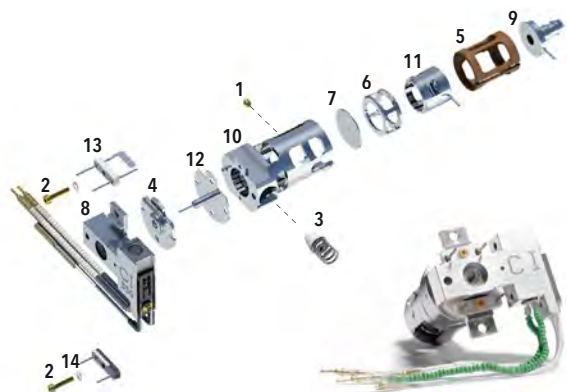


5975/5973 MSD CHEMICAL IONIZATION ION SOURCE PARTS (CI)

ITEM	DESCRIPTION	PART NO
2	Cap screw, gold plated	G1999-20021
7	Drawout plate	G1999-20446
8	5977 CI 350 repeller assembly	G3170-60416
9	Entrance lens	G3170-20126
13	Filament assembly (CI), 2/pk	G7005-60072

5975/5973 MSD

Chemical Ionization Ion Source Parts (CI)



Agilent Mass Spectrometer Supplies (cont.)

MSD Filaments

AGILENT MSD FILAMENTS				
DESCRIPTION	7000 SERIES	5977 SERIES	5975 SERIES	5973 SERIES
Filament assembly, high temperature (EI), ea	G7005-60061	G7005-60061	G7005-60061	G7005-60061
Filament assembly (CI), 2/pk	G7005-60072	G7005-60072	G7005-60072	G7005-60072

G7005-60061



G7005-60072



MSD Electron Multipliers and Replacement Horn

AGILENT MSD ELECTRON MULTIPLIERS AND REPLACEMENT HORN					
DESCRIPTION	7000A SERIES	7000B/C SERIES	5973 SERIES	5975 SERIES	5977 SERIES
Electron multiplier replacement horn Use with electron multipliers with "straight" horns	—	—	05971-80103	05971-80103	—
Triple Axis Detector Assy, 5975 Ceramic	G3170-80105	—	—	G3170-80105	G3170-80105
Triple axis electron multiplier	G3170-80103	G3170-80103	—	G3170-80103	G3170-80103
High energy dynode	—	—	G1099-80001	—	—

*Included on 5975 triple axis detector systems

G3170-80103



05971-80103



Cleaning & Maintenance Supplies

AGILENT CLEANING & MAINTENANCE SUPPLIES	
DESCRIPTION	PART NO
One Year Maintenance Kit (for diffusion pump systems). Includes Big Universal Trap for He (1/8"), abrasive sheets (5/pk), lint-free cloths (15/pk), cotton swabs (100/pk), SantoVac Ultra, 18.5 mL (2 ea), rough pump oil (1 L), filament assembly, octafluoronaphthalene (OFN)	5183-2096
Nylon gloves, lint-free, large, 1 pair	8650-0030
Nylon gloves, lint-free, small, 1 pair	8650-0029
Lint-free industrial wipes, 100% cotton, 9" x 9", 300/pk	9310-4828
Ion source cleaning kit. Includes lint-free cloths (15/pk), abrasive sheets (5/pk), cotton swabs (100/pk), lint-free nylon gloves, abrasive Alumina powder	5181-8863
Cloths, lint-free, 15/pk	05980-60051
Cotton swabs, 100/pk	5080-5400
Abrasive sheets, aluminum oxide green lapping paper, 600 mesh, 5/pk	5061-5896
Alumina powder, abrasive, 1 kg	8660-0791
PFTBA sample, certified, 10 g, 5.32 mL	8500-0656
Replacement glass bulb for PFTBA and PFDTD test sample	G3170-80002
Replacement glass vial for PFTBA and PFDTD test sample	05980-20018
Activated alumina, absorbent pellets for Edwards rough pump traps, non-LC/MS, 1 lb can	8500-1233
Quiet Cover DS for vacuum pump models: Agilent DS202, DS302, DS402, DS602	G6012A
Quiet Cover GC/MS for vacuum pump Models: Pfeiffer Duo2.5, Agilent DS42, Agilent DS42i, Edwards E2M1.5 2.5, Pfeiffer Duo 2.5 G or Higher	G6014B

05980-60051



5080-5400



G6012A

Quiet Cover for vacuum pumps



Removable oil tray



Easy access to pump

Agilent 7693A Autosampler Syringes





Blue Line Autosampler Syringes with Fitted plunger syringes are recommended for homogeneous liquid samples. Each fitted syringe is individually matched with the plunger for precision injection. Plungers are not interchangeable or replaceable. Blue Line Autosampler Syringes with PTFE-Tipped Plungers are suitable for gas and liquid samples, the PTFE tip of the plunger creates a tight seal between the plunger and glass, helping to reduce carry-over and increase syringe lifetime. Replacement plungers are available.



AGILENT 7693A AUTOSAMPLER SYRINGES

		VOLUME	1 μL	2 μL	
		DESCRIPTION	GAUGE	42 mm/cone tip	42 mm/cone tip
Fixed Needle		Blue Line w/fitted plunger	23	G4513-80229	G4513-80215
		Replacement plunger		G4513-80240	G4513-80239


AGILENT 7693A AUTOSAMPLER SYRINGES

		VOLUME	5 μL	10 μL	25 μL	50 μL	100 μL	
		DESCRIPTION	GAUGE	42 mm/HP tip	42 mm/HP tip	42 mm/HP tip	42 mm/HP tip	
Fixed Needle Syringes		Blue Line w/fitted plunger	23	G4513-80213 G4513-80205 (6/pk)	G4513-80209 G4513-80202 (6/pk)			
			26s	G4513-80226 G4513-80212 (6/pk)	G4513-80216 G4513-80211 (6/pk)			
			23 – 26s	G4513-80206 G4513-80201 (6/pk)	G4513-80204 G4513-80200 (6/pk)			
			23 – 26			G4513-80242	G4513-80244	G4513-80243
		Blue Line w/PTFE-tipped plunger	23		G4513-80220 G4513-80210 (6/pk)	G4513-80228	G4513-80221	
			23 – 26s		G4513-80203 G4513-80208 (6/pk)			
			23 – 26			G4513-80241	G4513-80223	G4513-80222
				Repl PTFE Tip plunger for FN		G4513-80227		
	Removable Needle Syringes & Repl Needles		Blue Line w/fitted plunger	23	G4513-80234	G4513-80235		
				23 – 26s	G4513-80224			
		Blue Line w/PTFE-tipped plunger	23		G4513-80219			
			23 – 26		G4513-80233			
		Replacement RN Needles (3/pk)	23 23 – 26s	G4513-80236 G4513-80225	G4513-80236 G4513-80225			

Advanced Sample Enhancement 7693A Autosampler Syringes with PTFE-Tipped Plungers

Used with the 7693A optional Enhanced Sample Handling Syringe Carriage, these syringes can eliminate analyst-to-analyst variability and reduce re-work in sample preparation, such as dilution and internal standard addition.

AGILENT SAMPLE ENHANCEMENT 7693A AUTOSAMPLER SYRINGES WITH PTFE-TIPPED PLUNGERS

		VOLUME	250 μL	500 μL	
		DESCRIPTION	GAUGE	42 mm/HP tip	42 mm/HP tip
Fixed Needle		Blue Line w/PTFE-tipped plunger	23	G4513-60560	G4513-60561

Agilent Gold Standard 7693A Autosampler Syringes

Use one needle and get the benefits of two. The upper portion of the tapered needle offers the strength of a 23-gauge needle, while the lower portion at 26s-gauge allows use with split/splitless or on-column injections with 0.53 mm ID columns. All standard plungers are stainless steel.

AGILENT GOLD STANDARD 7693A AUTOSAMPLER SYRINGES

	VOLUME	DESCRIPTION	GAUGE	1 μ L	2 μ L
				42 mm/HP tip	42 mm/HP tip
Fixed Needle		Blue Line w/fitted plunger	23	5188-5246	5188-5247



AGILENT GOLD STANDARD 7693A AUTOSAMPLER SYRINGES

	VOLUME	DESCRIPTION	GAUGE	5 μ L	10 μ L	25 μ L	50 μ L	100 μ L
				42 mm/HP tip	42 mm/HP tip	42 mm/HP tip	42 mm/HP tip	42 mm/HP tip
Fixed Needle Syringes	Blue Line w/fitted plunger	23	23	9301-0892 5182-0875 (6/pk)	9301-0713 9301-0725 (6/pk)			
		26s	26s	9301-0891 5183-4728 (6/pk)	9301-0714 5183-4729 (6/pk)			
		23 - 26s	23 - 26s	5181-1273 5181-8810 (6/pk)	5181-1267 5181-3360 (6/pk)			
	Replacement plunger for FN				5181-8808			
	Blue Line w/PTFE-tipped plunger	23	23		5181-8809 5183-4730 (6/pk)	5183-0316	5183-0318	5183-2058
		23 - 26s	23 - 26s		5181-3354 5181-3361 (6/pk)		5183-0314	5183-2042
Repl PTFE Tip plunger for FN				5181-3365				
Removable Needle Syringes & Repl Needles	Blue Line w/fitted plunger	23	23	5182-0834	5181-8806			
		23 - 26s	23 - 26s	5182-0835	5181-3321			
	Blue Line w/PTFE-tipped plunger	23	23		5181-8813			
		23 - 26s	23 - 26s		5181-3356 5181-3358			
	Repl PTFE Tip plunger for RN				5181-3358			
Replacement RN Needles (3/pk)			23 23-26s	5182-0830 5182-0832	5181-8811 5181-3319			

HP 7670/71/72 Autosampler Syringes

HP 7670/71/72 AUTOSAMPLER SYRINGES

	VOLUME	DESCRIPTION	GAUGE	5 μ L	10 μ L
				56 mm/Pt 2	50 mm/HP tip
	Straight, removable	23		5182-9622	5182-9626
	Straight, fixed	23			5182-9734
	Straight, fixed, PTFE-tipped plunger	23			5182-9799

7673/7683 On-Column Autosampler Syringes

7673/7683 ON-COLUMN AUTOSAMPLER SYRINGES

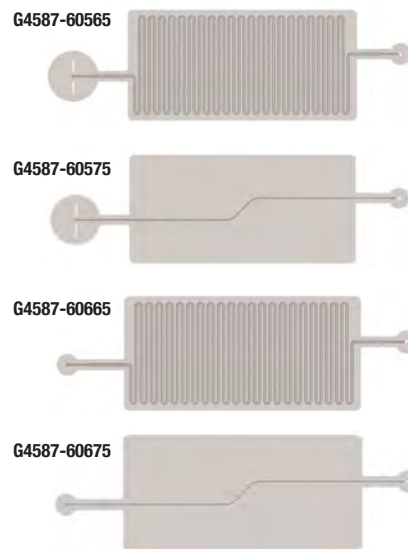
	VOLUME	DESCRIPTION	5 μ L
	Removable needle, syringe only		5182-0836
	SS needle for 0.53 mm column		5182-0832 (3/pk)
	SS needle for 0.32 mm column		5182-0831 (3/pk)
	SS needle for 0.25 mm column		5182-0833 (3/pk)
	Plunger button		5181-8866 (10/pk)

Agilent Intuvo Guard Chips

The Intuvo Guard Chip is an innovative solution that replaces guard columns and extends column lifetime. The Guard Chip is a simple disposable chip that is easily installed and replaced in minutes. These chips prevent unwanted material from depositing on, and damaging the head of the column by providing almost a meter of sample flow path just before the Intuvo GC column. This protection eliminates the need for retention time adjustment and means that you never have to trim a column again.

For applications where a Guard Chip is not needed, the jumper chip provides a short direct flow path. The guard and jumper chips are inlet-dependent so versions are available for split/splitless inlets and the multimode inlet.

AGILENT INTUVO GUARD CHIPS		
PART NO	DESCRIPTION	QTY
G4587-60565	Guard Chip, Intuvo, split/splitless inlet	2/pk
G4587-60575	Jumper Chip, Intuvo, split/splitless inlet	ea
G4587-60665	Guard Chip, Intuvo, multimode inlet	2/pk
G4587-60675	Jumper Chip, Intuvo, multimode inlet	ea



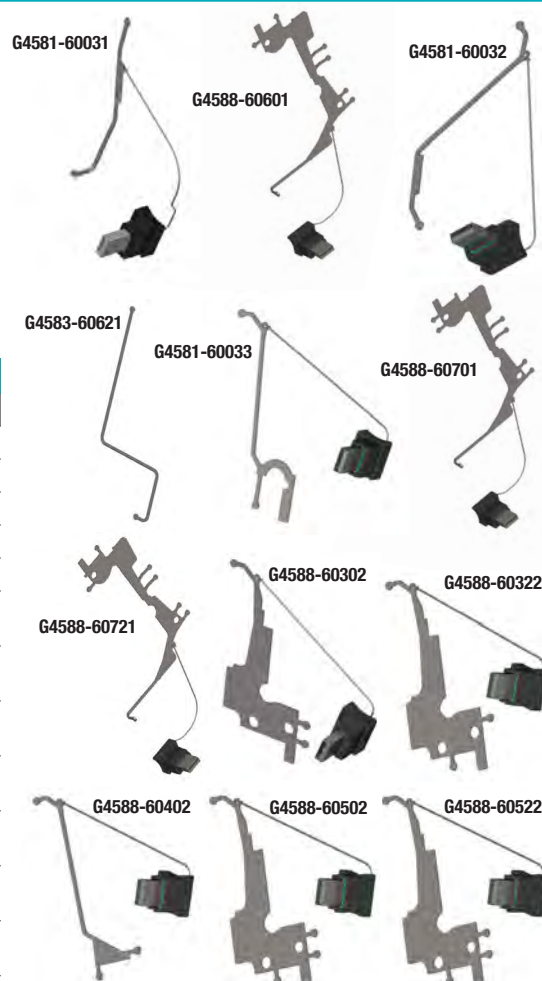
Agilent Intuvo Flow Chips

Intuvo Flow Chips are modular components that enable flexible configuration of the GC flow path. These chips provide connections between the inlet, column, and detector without the need for cumbersome ferrules. Furthermore, Intuvo Flow Chips are fitted with smart keys, so Intuvo knows exactly how to set itself up, whether for splitting, backflush, GC detectors, or mass spectrometry.

The inlet chip provides a direct connection from the Guard Chip to the column. The D1, D2 and D2-MS chips provide a connection from the column to detector 1, detector 2, or the mass spectrometer. The remaining Flow Chips combine all the complex connections for backflush and splitting into a single device.

Some of the Flow Chips require an Intuvo with an additional EPC module configured.

AGILENT FLOW CHIPS		
PART NO	DESCRIPTION	PURPOSE
G4581-60031	Inlet	Connects Guard Chip to column
G4588-60601	Inlet splitter chip	Splits flow from Guard Chip to two columns
G4581-60032	D1	Connects column to detector 1
G4583-60621	D2	Connects column to detector 2
G4581-60033	D2-MS	Connects column to MS
G4588-60701	Mid column backflush to D1	Connects column to detector 1, mid column backflush capability
G4588-60721	Mid column backflush to D2	Connects column to detector 2, mid column backflush capability
G4588-60302	D1 post column backflush	Connects column to detector 1, post column backflush capability
G4588-60322	D2-MS post column backflush	Connects column to MS detector, post column backflush capability
G4588-60402	D1-D2 splitter chip, 1:1	Equally splits column effluent between two GC detectors
G4588-60502	D1-MS splitter chip, 1:1	Equally splits column effluent between GC detector and MS
G4588-60522	D1-MS splitter chip, 7:1	Splits column effluent between GC detector and MS at 7:1 ratio



Agilent Intuvo Detector Tails

AGILENT DETECTOR TAILS	
PART NO	DESCRIPTION
G4590-60009	Flow Chip, Intuvo, swaged MS tail
G4590-60109	Flow Chip, Intuvo, swaged HES MS tail
G4583-60331	Flow Chip, Intuvo, FID-TCD tail
G4583-60333	Flow Chip, Intuvo, ECD tail
G4583-60334	Flow Chip, Intuvo, NPD tail
G4583-60335	Flow Chip, Intuvo, FPD tail
G4583-60336	Flow Chip, Intuvo, XCD tail



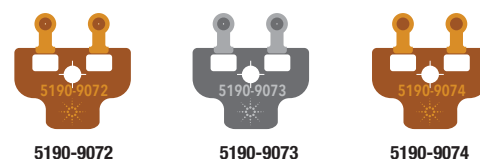
Agilent Intuvo Gaskets

Intuvo uses ferrule-free face seals for all fittings within the sample gas flow path. Gaskets take the place of ferrules throughout the GC, providing the face seal between components of the Intuvo flow path. Easily replaced, these unique leak-free connections enable confident click-and-run column changes.

The Intuvo gaskets are available in three types: polyimide, nickel, and as a plug. The polyimide gasket is for standard use up to 350 °C, while the nickel gasket provides a solution for high temperature applications up to 450 °C. The plug gasket can be used to check for leaks and for troubleshooting the flow path.

AGILENT INTUVO GASKETS		
PART NO	DESCRIPTION	QTY
5190-9072	Gasket, Intuvo, polyimide	5/pk
5190-9073	Gasket, Intuvo, nickel	2/pk
5190-9074	Gasket plug, Intuvo, polyimide	2/pk

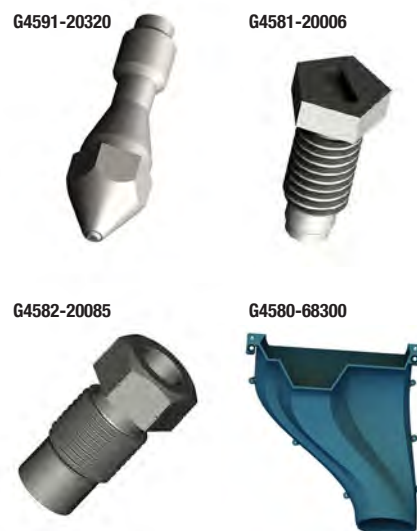
Intuvo gaskets are intended for one-time use



Agilent Intuvo Supplies

AGILENT INTUVO SUPPLIES	
PART NO	DESCRIPTION
UNIQUE DETECTOR PARTS	
G4591-20320	FID Jet 0.11" ID
COMPRESSION BOLTS	
G4583-20005	Compression bolt, detector tail
G4581-60260	Compression bolt, Intuvo
G4581-20006	Compression bolt, Guard Chip
G4582-20085	Compression bolt, split/splitless inlet
G4586-20027	Compression bolt, multimode inlet
TOOLS	
8710-2801	Wrench, open end, 0.3125"
8710-2800	Wrench, open end, 0.25"
5190-9571	Torque driver kit, includes G4581-20522 and 8710-2790
G4581-20522	Torque driver extension*
8710-2790	Screw driver, torque, preset adjustable*
EXHAUST VENT	
G4580-68300	Exhaust Vent

*Includes in 5190-9571



SGE Autosampler Syringes for Agilent 7673, 7683 & 6850 ALS

All needles are 42 mm long with a cone point.

VOLUME	NEEDLE GAUGE (OD mm)	SYRINGE CODE	SYRINGE	QTY	SPARE NEEDLE	QTY	SPARE PLUNGER	QTY
FIXED TAPERED NEEDLE								
5 µL	23 – 26s (0.63/0.47)	5F-AG-0.63/0.47C	001821	ea	—	—	—	—
10 µL	23 – 26s (0.63/0.47)	10F-AG-0.63/0.47C	002821	ea	—	—	—	—
10 µL Gas Tight	23 – 26s (0.63/0.47)	10F-AG-GT-0.63/0.47C	002826	ea	—	—	031808	2/pk
FIXED STRAIGHT NEEDLE								
5 µL	26 (0.47)	5F-AG-0.47C	001800	ea	—	—	—	—
5 µL(M)	23 (0.63)	5F-AG-0.63C	001810	ea	—	—	—	—
10 µL	26 (0.47)	10F-AG-0.47C	002800	ea	—	—	—	—
10 µL(M)	23 (0.63)	10F-AG-0.63C	002810	ea	—	—	—	—
10 µL(M) Gas Tight	23 (0.63)	10F-AG-GT-0.63C	002812	ea	—	—	031808	2/pk
REMOVABLE TAPERED NEEDLE								
0.5 µL	23 – 26s (0.63/0.47)	0.5BR-AG-0.63/0.47C	000415	ea	033730	ea**	—	—
10 µL	23 – 26s (0.63/0.47)	10R-AG-0.63/0.47C	—	ea	037730	2/pk	—	—
10 µL Gas Tight	23 – 26s (0.63/0.47)	10R-AG-GT-0.63/0.47C	002829	ea	037730	2/pk	031809	2/pk
REMOVABLE STRAIGHT NEEDLE								
0.5 µL	26 (0.47)	0.5BR-AG-0.47C	000400	ea	033708	ea**	—	—
0.5 µL(M)	23 (0.63)	0.5BR-AG-0.63C	000410	ea	033715	ea**	—	—
1 µL	23 (0.63)	1BR-AG-0.63C	000610	ea	034715	ea**	—	—
10 µL	26 (0.47)	10R-AG-0.47C	002805	ea	037715	2/pk	—	—
10 µL(M)	23 (0.63)	10R-AG-0.63C	002815	ea	037717	2/pk	—	—

(M) Suitable for use with the Merlin Microseal™ Injector

** Denotes Spare Needle and Plunger kit

000610



000415



001821



SGE Septa for Agilent Instruments

PART NO	DIAMETER	SEPTUM TYPE	QTY
FOR AGILENT 7890, 6890, 5890, 5880, 4890 & 6850			
041826	11	CS	50/pk
041856	11	TCS Pre-drilled	50/pk
041883	11	Auto-Sep T™	100/pk
041898	11	HT	25/pk
041902	11	EC	25/pk

SGE Inlet Liners for Agilent Instruments

DESCRIPTION AND GEOMETRY SKETCH	OD (mm)	ID (mm)	LENGTH (mm)	QTY	PART NO
FOR AGILENT 5890, 6850, 6890, 7890 & HP4890					
Split / Splitless FocusLiner™ 	6.3	4	78.5	ea	09200201
				5/pk	092002
				25/pk	092219
Split/ Splitless Tapered FocusLiner™ 	6.3	4	78.5	ea	09200301
				5/pk	092003
				25/pk	092011
Split / Splitless FAST FocusLiner™ 	6.3	2.3	78.5	ea	09200501
				5/pk	092005
				25/pk	092008
Split/Splitless Tapered FAST FocusLiner™ 	6.3	2.3	78.5	ea	09211101
				5/pk	092111
				25/pk	092115
Split, Straight-through Liner 	6.3	4	78.5	ea	09200701
				5/pk	092007
				25/pk	092222
Split, with Quartz Wool 	6.3	4	78.5	ea	09200101
				5/pk	092001
				25/pk	092220
Split / Splitless with Single Taper 	6.3	4	78.5	ea	09201701
				5/pk	092017
				25/pk	092229
Split / Splitless with Single Taper (Quartz Wool) 	6.3	2.3	78.5	ea	09201901
				5/pk	092019
				25/pk	092218
Split / Splitless with Double Taper 	6.3	2.3	78.5	ea	09201801
				5/pk	092018
				25/pk	092230
Direct, Straight-through Liner 	6.3	1.2	78.5	5/pk	092016
				25/pk	092224
Split / Splitless Quartz, Straight-through Liner 	6.3	2	78.5	ea	09200401
				5/pk	092004
Splitless with Recessed Gooseneck 	6.3	2	78.5	ea	09201301
				5/pk	092013
Split / Splitless Recessed Gooseneck (Quartz Wool) 	6.3	4	78.5	ea	09201001
				5/pk	092010
				25/pk	092223
PACKED COLUMN LINER FOR AGILENT 5880, 5890, & 6890					
1.8 mm ID Packed Column Liner 	3	1.8	92	ea	09223401
				5/pk	092234
				25/pk	092235
FOR AC CONTROL INJECTOR					
Sim Dist Liner for Programmed Injector 	3	1.6	73	5/pk	092210
				25/pk	092211
FOR GERSTEL CIS 4 INJECTOR					
Sintered Glass, Large Volume Injection (LVI) 	3	1.8	71	ea	09224301
				5/pk	092243
Single Baffle 	3	1.8	71	5/pk	092246

- Taper/Gooseneck
- FocusLiner™
- Taper Focus
- ConnecTite™
- Straight
- Double Taper
- PTV/LVI

092017 092002



092003 092004



SGE O-Rings for Agilent Instruments

PART NO	DESCRIPTION	USAGE	QTY
0726532	Viton O-Ring	Can be used at temperatures up to 300 °C. Suitable for liners with OD of 6.3 mm.	10/pk
0726005	Graphite Sealing Ring	Can be used at temperatures up to 450 °C. Suitable for all inlet liners above except 092004 and 09200401.	10/pk
0726006	Graphite Sealing Ring	Can be used at temperatures up to 450 °C. Suitable for use with liners 092004 and 09200401	10/pk

SGE Ferrules for Agilent Instruments

INSTRUMENT	COLUMN ID	FERRULE ID	QTY	PART NO
15% GRAPHITE / 85% VESPEL® FERRULES				
For Injectors & Detectors at atmospheric pressure e.g. FID	0.1 – 0.25 mm	0.4 mm	10/pk	073109
	0.32 mm	0.5 mm	10/pk	073111
	0.53 mm	0.8 mm	10/pk	073113
	for 1/8" OD Packed Columns	1/8"	10/pk	072669
	for 1/4" OD Packed Columns	1/4"	10/pk	072667
For GC-MS Interface Connection	0.1 – 0.25 mm	0.4 mm	10/pk	072663
	0.32 mm	0.5 mm	10/pk	072654
	0.53 mm	0.8 mm	10/pk	072655
100% GRAPHITE FERRULES				
Injectors & Detectors at atmospheric pressure e.g. FID (Not for GC-MS)	0.1 – 0.32 mm	0.5 mm	10/pk	072635
	0.45 – 0.53 mm	0.8 mm	10/pk	072636
	for 1/8" OD Packed Columns	1/8"	10/pk	072602
	for 1/4" OD Packed Columns	1/4"	10/pk	072601
SiITite™ METAL FERRULES				
For GC-MS Interface Connection (Starter Kit)	0.1 – 0.25 mm	0.4 mm	10/pk	*073200
	0.32 mm	0.5 mm	10/pk	*073201
	0.53 mm	0.8 mm	10/pk	*073202
For Split / Splitless Injectors (Starter Kit)	0.1 – 0.25 mm	0.4 mm	10/pk	**073270
	0.32 mm	0.5 mm	10/pk	**073271
	0.45 – 0.53 mm	0.8 mm	10/pk	**073272
	1/32"	0.81 mm	10/pk	**073273
REPLACEMENT SiITite™ METAL FERRULES				
For All Connections	0.1 – 0.25mm	0.4 mm	10/pk	073220
	0.32 mm	0.5 mm	10/pk	073221
	0.53 mm	0.8 mm	10/pk	073222
	1/32"	0.81 mm	10/pk	073219
REPLACEMENT SiITite™ NUTS				
For GC-MA Interface Connections	—	—	5/pk	073224
For Split / Splitless Injector	—	—	5/pk	073226
REPLACEMENT SiITite™ BASE SEALS				
For Split / Splitless Injector	—	—	2/pk	073400
	—	—	10/pk	073401

* Includes: 10 ferrules, 2 SiITite™ nuts

** Includes: 10 ferrules, 2 SiITite™ nuts and 2 SiITite™ Inlet Base Seals



SGE SilTite™ FingerTite Ferrules for Agilent Instruments

PART NO	DESCRIPTION		QTY
073610	Siltite™ Fingertite Agilent INJ / FID Starter Kit		*
073612	Siltite™ Fingertite Agilent INJ / MS Starter Kit		*
073630	Siltite™ Fingertite Ferrule 0.4 mm	Replacement Items	10/pk
073631	Siltite™ Fingertite Ferrule 0.5 mm	Replacement Items	10/pk
073633	Siltite™ Fingertite Blanking Ferrule	Replacement Items	2/pk
073636	Siltite™ Fingertite Female Nut	Replacement Items	5/pk
073640	Siltite™ Fingertite Agilent INJ Base Seal	Replacement Items	2/pk

* Each starter kit includes all the parts necessary to convert one GC system (one injector and one detector) to the SilTite™ FingerTite system suitable for installing 0.1 – 0.25 mm ID capillary columns. In addition there are 5 SilTite™ FingerTite nuts, one packet (10 ferrules) of 0.4 mm ID SilTite™ Fingertite ferrules and a ferrule install tool which allows you to seat the ferrule in the correct position on the capillary column.



SGE Electron Multipliers for Agilent Instruments

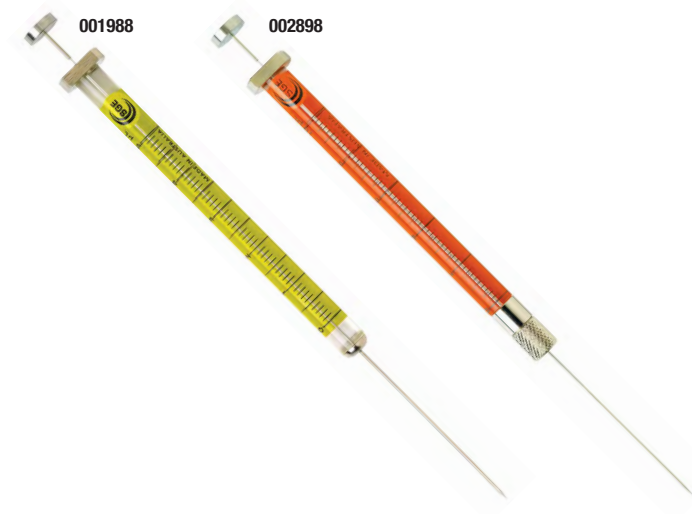
PART NO	INSTRUMENT	ANALYZER TYPE	TECHNIQUE
14511	5970 (All)	Quadrupole	GC-MS
14516	5971, 5972, GCD	Quadrupole	GC-MS
14617	5973 (For initial installation—includes mount)	Quadrupole	GC-MS
14616	5973 (Replacement multiplier only)	Quadrupole	GC-MS

SGE Autosampler Syringes for Shimadzu AOC14, AOC17 and AOC20

All needles are 42 mm long with a cone point style.

VOLUME	NEEDLE GAUGE (OD mm)	SYRINGE CODE	SYRINGE	QTY	SPARE NEEDLE	QTY	SPARE PLUNGER	QTY
FIXED NEEDLE								
5 µL	23 (0.63)	5F-S-0.63C	001988	ea	—	—	—	—
REMOVABLE NEEDLE								
0.5 µL	26 (0.47)	0.5BR-PE-0.47C	000440	ea	033738	ea*	—	—
0.5 µL	23 (0.63)	0.5BR-PE-0.63C	000445	ea	033745	ea*	—	—
0.5 µL	23 – 26s (0.63/0.47)	0.5BNR-S-0.63/0.47C	—	—	033730	ea*	—	—
10 µL	26 (0.47)	10R-S-0.47C	002897	ea	037745	2/pk	—	—
10 µL	23 (0.63)	10R-S-0.63C	002898	ea	037747	2/pk	—	—
10 µL Gas Tight	23 (0.63)	10R-S-GT-0.63C	002902	ea	037747	2/pk	031798	2/pk



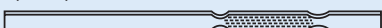


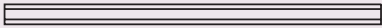
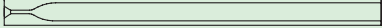
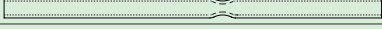



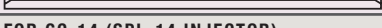
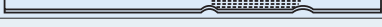
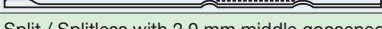

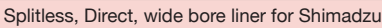

*Denotes spare Needle and Plunger kit.



SGE Septa for Shimadzu Instruments

PART NO	SEPTUM TYPE	QTY
FOR SHIMADZU 9A, 14, 15A, 16, 17A, 2010 & 2014		
041890	Enduro Blue	50/pk
041895	HT	50/pk

SGE Inlet Liners for Shimadzu Instruments

DESCRIPTION AND GEOMETRY SKETCH	OD (mm)	ID (mm)	LENGTH (mm)	QTY	PART NO
FOR GC-2010 (SPL-2010 INJECTOR), GC-2014 (SPL-2014 INJECTOR) AND GC-17A (SPL-17 INJECTOR)					
Split/ Splitless FocusLiner™ *	5	3.4	95	ea	09205901
				5/pk	092059
				25/pk	09205925
Split / Splitless Tapered FocusLiner™	5	3.4	95	ea	09205801
				5/pk	092058
				25/pk	09205825
Split/ Splitless FocusLiner™	5	3.4	95	ea	09206201
				5/pk	092062
Split/ Splitless Tapered FocusLiner™	5	3.4	95	ea	09206801
				5/pk	092068
				25/pk	09206825
Split, Straight-through Liner	5	3.4	95	ea	09206401
				5/pk	092064
Splitless, Straight-through Liner	5	2.6	95	ea	092086101
				5/pk	0920861
Split / Splitless with Single Taper	5	3.4	95	ea	09207101
				5/pk	092071
Split / Splitless with middle gooseneck	5	3.4	95	ea	09207701
				5/pk	092077
Split / Splitless with recessed gooseneck & quartz wool	5	3.4	95	ea	09206101
				5/pk	092061
Split / Splitless with middle gooseneck	5	3.4	95	ea	09208501
				5/pk	092085
				25/pk	09208525
ConnecTite™ (0.53 mm ID columns)	5	2.6	95	ea	09208701
				5/pk	092087
SPME Liner	5	0.75	95	ea	09208901
				5/pk	092089
FOR GC-14 (SPL-14 INJECTOR)					
Split / Splitless FocusLiner™	5	3.4	99	ea	09206501
				5/pk	092065
Split / Splitless Tapered FocusLiner™	5	3.4	99	ea	09206601
				5/pk	092066
Split / Splitless with 2.0 mm middle gooseneck	5	3.4	99	ea	09208201
				5/pk	092082
Split / Splitless with Single Taper	5	3.4	99	ea	092083101
				5/pk	0920831
Splitless, Direct, wide bore liner for Shimadzu 9A/16A GC	5	3.4	139	ea	09208401
				5/pk	092084

- Taper/Gooseneck
- FocusLiner™
- Taper Focus
- ConnecTite™
- Straight
- Double Taper
- PTV/LVI

* When using a standard 42 mm needle for autosamplers, the sample will be injected on top of the wool for this liner.

SGE O-Rings and Sealing Rings for Shimadzu Instruments

PART NO	DESCRIPTION	USAGE	QTY
0726001	Graphite Sealing Ring	Can be used at temperatures up to 450 °C. For 14, 15A & 16 (SPL-14 injector)	10/pk
0726007	Graphite Sealing Ring	Can be used at temperatures up to 450 °C For 17A (SPL-17 injector)	10/pk
0726533	Viton O-Ring	Can be used at temperatures up to 300 °C For 2010 & 2014 (SPL-2010 injector & SPL-2014 injector)	10/pk

SGE Ferrules for Shimadzu Instruments

PART NO	COLUMN ID	DESCRIPTION	QTY
FOR GC14A, GC17A, GC2010 AND GC2014 DETECTOR / INJECTORS (NOT FOR MS INTERFACES OR QP2010 INJECTOR)			
0726080	0.1 – 0.32 mm ID columns	100% Graphite	10/pk
0726082	0.45 – 0.53 mm ID columns	100 % Graphite	10/pk
0726001	5 mm OD packed columns	100% Graphite	10/pk
073350	0.10 – 0.25 mm ID columns	SiTite™ Metal—Initial installation	10/pk*
073227	0.10 – 0.25 mm ID columns	SiTite™ Ferrules	10/pk
073351	0.32 mm ID columns	SiTite™ Metal—Initial Installation	10/pk*
073228	0.32 mm ID columns	SiTite™ Ferrules	10/pk
073352	0.45 – 0.53 mm ID columns	SiTite™ Metal—Initial Installation	10/pk*
073229	0.53 mm ID columns	SiTite™ Ferrules	10/pk
073232	n/a	SiTite™ Metal Nuts—Slotted	5/pk
FOR QP5000/5050 STANDARD MS INTERFACE			
0726563	QP5000-I 0.10 – 0.25 mm ID columns	15% Graphite / 85% Vespel® Ferrules	10/pk
0726564	QP5000-I 0.32 mm ID columns	15% Graphite / 85% Vespel® Ferrules	10/pk
0726561	QP5000-II & QP5050 0.10 – 0.25 mm ID columns	15% Graphite / 85% Vespel® Ferrules	10/pk
0726562	QP5000-II & QP5050 0.32 mm ID columns	15% Graphite / 85% Vespel® Ferrules	10/pk
073204	0.10 – 0.25 mm ID columns	SiTite™ Metal—Initial Installation	10/pk*
073227	0.10 – 0.25 mm ID columns	SiTite™ Ferrules	10/pk
073205	0.32 mm ID columns	SiTite™ Metal—Initial Installation	10/pk*
073228	0.32 mm ID columns	SiTite™ Ferrules	10/pk
073229	0.53 mm ID columns	SiTite™ Ferrules	10/pk
073233	n/a	SiTite™ Metal Nuts	5/pk
FOR QP5000/5050 WIDE BORE MS INTERFACE, QP2010 INJECTOR AND QP2010 STANDARD MS INTERFACE			
072663	0.10 – 0.25 mm ID column	15% Graphite / 85% Vespel® Ferrules	10/pk
072654	0.32 mm ID columns	15% Graphite / 85% Vespel® Ferrules	10/pk
072655	0.45 – 0.53 mm ID columns	15% Graphite / 85% Vespel® Ferrules	10/pk
073200	0.10 – 0.25 mm ID columns	SiTite™ Metal—Initial Installation	10/pk*
073220	0.10 – 0.25 mm ID columns	SiTite™ Ferrules	10/pk
073201	0.32 mm ID columns	SiTite™ Metal—Initial Installation	10/pk*
073221	0.32 mm ID columns	SiTite™ Ferrules	10/pk
073202	0.45 – 0.53 mm ID columns	SiTite™ Metal—Initial Installation	10/pk*
073222	0.45 – 0.53 mm ID columns	SiTite™ Ferrules	10/pk
073224	n/a	SiTite™ Metal Nuts	5/pk

* Includes 10 ferrules, 2 SiTite™ nuts

072663



073224



SGE Replacement SilTite™ Nuts for Shimadzu Instruments

PART NO	MATERIAL	QTY
073224	For 2010 GC-MS System	5/pk
073224	For 2010 GC-MS System with QP5000 series MS	5/pk
073224	For 2010 / 2014 GC Injectors and atmospheric detectors	5/pk
073224	QP5000 Jet Separator MS Interface	5/pk
073233	QP5000 Direct MS Interface	5/pk
073232	For All Injectors Jet Separator (Starter Kit) except 2010/2014	5/pk

SGE SilTite™ FingerTite Ferrules for Shimadzu Instruments

PART NO	DESCRIPTION	QTY
073620	SilTite™ Fingertite Shimadzu 2010 Inj / Fid Starter Kit	*
073621	SilTite™ Fingertite	5/pk
073630	SilTite™ Fingertite Ferrule 0.4 mm Replacement Items	10/pk
073631	SilTite™ Fingertite Ferrule 0.5 mm Replacement Items	10/pk
073633	SilTite™ Fingertite Blanking Ferrule Replacement Items	2/pk
073636	SilTite™ Fingertite Female Nut Replacement Items	5/pk

* Each starter kit includes all the parts necessary to convert one GC system (one injector and one detector) to the SilTite™ FingerTite system suitable for installing 0.1 – 0.25 mm ID capillary columns. In addition there are 5 SilTite™ FingerTite nuts, one packet (10 ferrules) of 0.4 mm ID SilTite™ Fingertite ferrules and a ferrule install tool which allows you to seat the ferrule in the correct position on the capillary column.

SGE Electron Multipliers for Shimadzu Instruments

PART NO	MS DESCRIPTION	ANALYZER TYPE	TECHNIQUE
14533	QP5000	Quadrupole	GC-MS

SGE Autosampler Syringes for Thermo Scientific / CE Instruments / Fisons


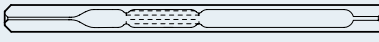

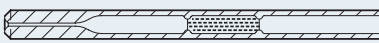

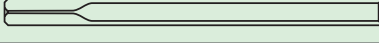

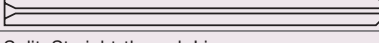



All needles have a cone point style.

AUTOSAMPLER				NEEDLE SPECIFICATIONS						
TriPlus	AS3000	AS2000	AS200/800	VOLUME (μL)	LENGTH (mm)	GAUGE	SYRINGE CODE	SYRINGE	NEEDLE	QTY
FIXED NEEDLE										
•		•		10	50	23 (0.63)	10F-C/T-GT-5/0.63C	002987	-	-
•		•		10	80	26 (0.47)	10F-C/T-8/0.47C	002992	-	-
•	•	•	•	10	50	23 (0.63)	10F-C/T-5/0.63C	002981	-	-
•	•	•	•	10	50	26 (0.47)	10F-C/T-5/0.47C	002980	-	-
REMOVABLE NEEDLE										
•	•	•		10	50	26 (0.47)	10R-C/T-5/0.47C	002982	-	-
•	•	•	•	10	50	23 (0.63)	10R-C/T-5/0.63C	002984	037787	2/pk
•		•	•	10	80	26 (0.47)	10R-C/T-8/0.47C	002993	031535	3/pk
•	•			5	50	26 (0.47)	0.5bnr-C/T-5/0.47C	000490	033770	-
•	•			5	50	23 (0.63)	0.2BNRC/T-5/0.63C	000492	033772	-

SGE Septa for Thermo 8000 Series, FOCUS, Trace/Ultra GC™

PART NO	DIAMETER	SEPTUM TYPE	QTY
0418990	17	HT	25/pk
041903	17	EE	25/pk

SGE Inlet Liners for Thermo TRACE™ & Focus™

DESCRIPTION AND GEOMETRY SKETCH	OD (mm)	ID (mm)	LENGTH (mm)	QTY	PART NO
Splitless FocusLiner™ (for use with 70 mm needle) 	8	5	105	ea 5/pk	09204501 092045
Splitless FocusLiner™ with Top-end Restriction (for use with 70 mm needle) 	8	5	105	ea 5/pk 25/pk	09204601 092046 09204625
Split FocusLiner™ (for use with 50 mm needle) 	8	5	105	5/pk	092048
Splitless FocusLiner™ (for use with 50 mm needle) 	8	5	105	ea 5/pk	09204901 092049
Splitless with Single Taper 	8	3	105	ea 5/pk 25/pk	09214101 092141 09214125
Splitless with Single Taper 	8	5	105	ea 5/pk 25/pk	09214401 092144 09214425
Splitless, Straight-through Liner 	8	3	105	ea 5/pk	09214701 092147
SPME Liner 	8	0.8	105	ea 5/pk	09214801 092148
Split, Straight-through Liner 	8	5	105	5/pk	092150
Trace 2000 PTV Liner 	2.75	1.75	120	5/pk	092142
Sintered Glass, Large Volume Injection (LVI) Liner 	2.75	0.78/1.8	120	ea 5/pk 25/pk	09215501 092155 09215525

- Taper/Gooseneck
- FocusLiner™
- Taper Focus
- ConnecTite™
- Straight
- Double Taper
- PTV/LVI

SGE Sealing Rings for Thermo Instruments

PART NO	DESCRIPTION	USAGE	QTY
0726004	Graphite Sealing Ring	8 mm ID. For 8000 & TRACE GCs.	10/pk

SGE Ferrules for Thermo Instruments

INSTRUMENT	COLUMN ID	FERRULE ID	QTY	PART NO
15% GRAPHITE / 85% VESPEL® FERRULES				
For All Injectors & Detectors (Not for 8000 Series, Focus, Trace/Ultra GC)	0.1 – 0.25 mm	0.4 mm	10/pk	0726549
	0.32 mm	0.5 mm	10/pk	0726557
	0.53 mm	0.8 mm	10/pk	0726548
For All Focus, Trace/Ultra Injectors & Detectors at atmospheric pressure e.g. FID (Not for GC-MS)	0.1 – 0.25 mm	0.4 mm	10/pk#	072696
	0.32 mm	0.5 mm	10/pk#	072697
	0.53 mm	0.8 mm	10/pk#	072698
Brass Nut for Focus, Trace/Ultra GC Injectors & Non-MS Detectors	—	—	2/pk	1034085
100% GRAPHITE FERRULES				
For Injectors & Detectors at atmospheric pressure e.g. FID (Not for GC-MS)	0.1 – 0.32 mm	0.5 mm	10/pk	072619
	0.45 – 0.53 mm	0.5 mm	10/pk	072614
	for 1/8" OD Packed Columns	1/8"	10/pk	072622
	for 1/4" OD Packed Columns	1/4"	10/pk	072621
SilTite™ METAL FERRULES				
For GC-MS Interface Connection (Starter Kit)	0.1 – 0.25 mm	0.4 mm	10/pk*	073450
	0.32 mm	0.5 mm	10/pk*	073451
	0.53 mm	0.8 mm	10/pk*	073452
REPLACEMENT SilTite™ METAL FERRULES				
For GC-MS Interface Connection	0.1 – 0.25 mm	0.4 mm	10/pk	073330
	0.32 mm	0.5 mm	10/pk	073331
	0.53 mm	0.8 mm	10/pk	073332
	1/32"	0.81 mm	10/pk	073333
Replacement SilTite™ Nuts	—	—	5/pk	073230

To be used in combination with brass nut (Part No. 1034085)

* Includes: 10 ferrules, 2 SilTite™ nuts

SGE SilTite™ FingerTite Ferrules for Thermo Instruments

PART NO	DESCRIPTION	COLUMN ID	FERRULE ID (mm)	QTY
073614	Injector/GC—MS (non—ISQ)	0.1 – 0.25 mm	0.4	*
073615	Injector/GC—MS ISQ	0.1 – 0.25 mm	0.4	*
073616	Injector/FID	0.1 – 0.25 mm	0.4	*
073630	Ferrule 0.4 mm	0.1 – 0.25 mm	0.4	10/pk
073631	Ferrule 0.5 mm	0.32 mm	0.5	10/pk
073633	Ferrule Blanking	—	—	2/pk
073636	Female Nut	—	—	5/pk

* Each starter kit includes all the parts necessary to convert one GC system (one injector and one detector) to the SilTite™ FingerTite system suitable for installing 0.1 – 0.25 mm ID capillary columns. In addition there are 5 SilTite™ FingerTite nuts, one packet (10 ferrules) of 0.4 mm ID SilTite™ FingerTite ferrules and a ferrule install tool which allows you to seat the ferrule in the correct position on the capillary column.

Agilent Flow Meters

Precision Gas Flow Meter

- High accurate and reliable measurement of common carrier and fuel gases used in GC, including nitrogen, air, carbon dioxide, hydrogen, helium, and argon methane
- Two year guaranteed calibration period traceable to NIST standards
- Measures flow based on gas viscosity properties with an accuracy of $\pm 0.8\%$ of reading + 0.2% of full scale volume
- Flow rate range from 5 – 500 mL/min
- Displays mass flow, volumetric flow, temperature and pressure readings simultaneously
- Can be plumbed inline



5067-0223

Agilent's Precision Gas Flow Meter is the ultimate gas flow meter for chromatography applications. This hand-held flow meter incorporates industry leading performance and features a highly accurate and reliable package. The inherent stability of the rugged, solid state components allows us to provide the longest calibration interval on the market, all traceable to NIST standards.

ADM Flowmeter

- Accuracy $\pm 2\%$ of reading or ± 0.2 mL/min
- Operating temp range—0 – 45 °C for the instrument, -62 – 110 °C for the tubing
- Calibration—NIST traceable cartridge (G6692A)
- Flow rate range from 0.5 – 750 mL/min
- Allows for continuous real time flow measurement with data storage



The Agilent ADM Flow Meter is a reliable platform for measuring volumetric gas flow without having to know the gas composition (limited to non-caustic gases). Moreover, the Agilent ADM Flow Meter does not have to be shipped back for recalibration to maintain NIST-Traceable standards. Simply order a new NIST-calibrated cartridge and replace the old cartridge yourself.

Guaranteed accuracy—A built-in calibration timer automatically warns you when the calibration cartridge needs replacing. This minimizes the risk of volumetric measurement drift.

Hands-free operation/easy view of screen—The kickstand feature allows you to conveniently operate above bench level.

Direct download of new features/capabilities—There's no need to ship the flow meter out every time a firmware upgrade is needed.

AGILENT FLOW METERS

PART NO	DESCRIPTION	FLOW RATE (mL/min)	ACCURACY	FLOW THROUGH DESIGN	GASES MEASURED (NON-CORROSIVE)	VOLUMETRIC ¹ OR MASS ² FLOW METER	COMMUNICATION	UNIQUE FEATURES	POWER SUPPLY
5067-0223	Precision Gas Flow Meter	5.0 – 500	$\pm 0.8\%$ of reading + 0.2% of full scale	Yes	N ₂ , H ₂ , He, Air, CO ₂ , CH ₄ , 95% Ar/CH ₄	Both	RS232 output	Displays mass flow, volumetric flow, temperature and pressure readings simultaneously	9v battery
G6691A	ADM Flow Meter	0.5 – 750	$\pm 2\%$ of reading or 0.2 mL/min, whichever is greater	No	All	Both	USB	Replaceable NIST calibrated cartridge	(3) AA Alkaline batteries & USB

ADM FLOW METER ACCESSORIES

G6692A	Replaceable NIST calibrated cartridge
5190-9576	FID Adapter
5190-9577	NPD Adapter
5190-9578	TCD Adapter
5190-9579	ECD Detector
5190-9580	Split Vent Adapter

1) Volumetric measurements are accurate and are independent of the gas that is being measured, allowing measurements of mixed gases commonly found in chromatography.
2) Mass flow measurements are very accurate for specific gases and are not affected by temperature and pressure fluctuations

Agilent Gas Leak Detector

- ➔ Detects thermal conductivity differences
- ➔ Audible and visual alerts
- ➔ Min. detection limit—0.0005 mL/min hydrogen and helium
- ➔ Lightweight—only 105 g
- ➔ Small—roughly 50 x 19.5 x 111 mm
- ➔ Rechargeable lithium ion battery with over 5 hours of life
- ➔ Includes a USB cable for battery charging
- ➔ One year warranty



G3388B

Gas leaks can cause detector noise and baseline instability, shorten column life and waste expensive carrier gas. Liquid leak detectors, although inexpensive, can contaminate your system. Agilent's G3388B electronic leak detector is an easy way to quickly identify leaks in your system and prevent system downtime.

AGILENT GAS LEAK DETECTOR

PART NO	DESCRIPTION
G3388B	Handheld electronic gas leak detector
ACCESSORIES	
5067-0218	Replacement filter tip
5067-0219	Replacement battery

Snoop

Leak test most pressurized gas systems. We recommend that leak detecting solutions be used with care where there is any possibility of the fluid being aspirated into gas flow streams supplying the column or detector. This squeezable bottle comes with a "Snooper Tube" extendable up to 12 inches. Electronic leak detectors are preferred. In their absence, a volatile nonreactive solvent like Snoop may be used. Use caution to avoid aspiration of materials such as snoop into the column.



SNOOP

PART NO	DESCRIPTION
9300-0311	Snoop, 8 oz (236 mL) bottle
460-1002	Snoop, 1 gallon bottle

Agilent Gas Cylinder Regulators, U.S. Only

To plumb your system properly, select one of our economical brass regulators and the proper gas purification devices from our newly expanded product offering.



BRASS BODY, DUAL STAINLESS STEEL DIAPHRAGMS SPECIFICATIONS

MAX INLET PRESSURE	OPERATION TEMP RANGE	INLET/OUTLET
3,000 PSI	-40 °F – 165 °F	1/4", MNPT
OUTLET VALVE	DELIVERY PRESSURES	WEIGHT
1/4", MNPT, 2 1/2" in dual-scale gauges, CGA-346, 350, 340, 580, 590, Internal self-seating relief valve	1 – 125 PSI	5.6 lb



GAS CYLINDER REGULATORS

PART NO	DESCRIPTION
BRASS BODY, TWO-STAGE STAINLESS STEEL DIAPHRAGMS, 1/8", U.S. ONLY ¹	
5183-4641	CGA 346, 125 psi max, Air
5183-4642	CGA 350, 125 psi max, H ₂ , Ar/Me
5183-4643	CGA 540, 125 psi max, O ₂
5183-4644	CGA 580, 125 psi max, He, Ar, N ₂
5183-4645	CGA 590, 125 psi max, Air
CONNECTORS (SWAGelok TO FEMALE NPT)	
0100-0118	1/8" (1) x 1/4" (B) connector, brass (included with brass regulators)
0100-0119	1/4" (A) x 1/4" (B) connector, brass ²
ACCESSORIES	
5180-4196	Copper tubing, 1/8", 50 ft
5021-7107	Copper tubing, 1/8", 12 ft
0460-1266	PTFE tape, industrial roll
5183-1941	Cylinder wall bracket with strap & chain (cylinder size up to 14", 35 cm)



0100-0118



0100-0119



5183-1941

DETECTOR	CONNECTION DIAGRAMS
FID Flame Ionization Detector (Carrier Gas = Make-Up Gas)	
FID Flame Ionization Detector (Carrier Gas differs from Make-Up Gas)	
MS (ITD, MSD) Ion Trap Detector, Mass Selective Detector Two Possibilities (See diagrams to the right)	
TCD Thermal Conductivity Detector	
ICP-OES/ICP-MS Inductively Coupled Plasma-Optical Emission Spectrometry/Mass Spectrometry (Plasma Gas = Nebulizer Gas)	
ICP-OES Inductively Coupled Plasma-Optical Emission (Different Optic Flush Gas)	

TECH TIP | Helpful Hints for Purification Success

- ➔ Determine desired purity level
- ➔ Keep number of fittings in gas line to a minimum
- ➔ Install purifiers in a convenient location close to GC
- ➔ Use purifier log books to determine maintenance and cartridge replacement schedule
- ➔ Use indicating traps closest to the GC so you can determine when to change the traps that are upstream

Agilent Gas Clean Filters

- ➔ Deliver clean gases for accurate analyses
- ➔ Fast, leak-free filter replacement reduces downtime
- ➔ Economical, with immediate payback
- ➔ Highly sensitive filter indicators provide maximum instrument protection

The Agilent Gas Clean Filter System delivers clean gases, reducing the risks of column damage, sensitivity loss, and instrument downtime. Inserting a Gas Clean Filter System in the gas line immediately before the instrument inlet greatly reduces the level of impurities, thus improving trace analysis. Contaminants entering your GC column will also be reduced, which is critical for high temperature analysis and essential for longer column lifetime.

Replacing the filters when they have reached absorption capacity ensures maximum protection of your GC columns and analytical hardware. The sensitive indicators change color, alerting you that the filter needs to be replaced.

A Gas Clean Filter System allows you to use 99.9999% (6.0) grade while still yielding high quality analytical results. The expected cost savings are 30%.



AGILENT GAS CLEAN FILTERS SPECIFICATIONS

PART NO	DESCRIPTION	FUNCTION	INDICATOR COLOR CHANGE	CAPACITY	OUTLET CONCENTRATION*
CP17970	Oxygen Filter	Removes oxygen as well as traces of sulfur and chlorine compounds from carrier gas	From green to gray	150 mL oxygen	< 50 µg/L
CP17971	Moisture Filter	Removes water, oil, and other foreign material from the carrier gas	From green to pale brown	7.2 g water	< 0.1 mg/L
CP17971P	Process Moisture Filter	Removes water, oil, and other foreign material from the carrier gas	From green to pale brown	7.2 g water	< 0.1 mg/L
CP17972	Charcoal Filter	Removes organic compounds from gas streams	No indicator	Approximately 7 g, depending on impurities	< 0.1 mg/L
CP17973	GC/MS Filter	Single combination filter, removes water, oxygen, and organic compounds	Oxygen, from green to gray; Moisture, from green to pale brown	100 mL oxygen, 1 g water, organics depending on impurities	Oxygen < 50 µg/L Moisture < 0.1 mg/L Organics < 0.1 mg/L
CP17969	CO ₂ Filter	Removes CO ₂ from the gas stream; use with moisture filter	From white to violet	9 g CO ₂	< 1 mg/L

*at operating flow of 1 – 10 L/min

AGILENT GAS CLEAN FILTER STARTER KITS

DESCRIPTION	1/4"	1/8"
Agilent Gas Clean FID Filter kit Includes a 4-position connecting unit and (2) Charcoal filters, (1) Oxygen filter, and (1) Moisture filter	CP7995	CP736530
Agilent GC Installation Kit Includes CP736530 and many useful fittings and accessories	—	19199N
Agilent Gas Clean GC/MS Filter kit Includes a 1-position connecting unit and (2) GC/MS filters	CP17977	CP17976
Agilent Gas Clean GC/MS Filter Installation kit Includes 1 m copper tubing (P/N CP17976), (2) nuts and (2) ferrules	—	CP17978
Agilent Gas Clean CO ₂ kit Includes 2-position connecting unit and CO ₂ and moisture filters	CP17982	CP17983
Agilent TCD Filter Kit Includes a 2-position connecting unit, (1) Oxygen filter, and (1) Moisture filter	—	CP738408
CONNECTING UNITS		
1-position connecting unit (filters sold separately)	CP7980	CP7988
2-position connecting unit (filters sold separately)	CP738406	CP738407
4-position connecting unit (filters sold separately)	CP7989	CP736520
High flow connecting unit, 2-position (filters sold separately)	CP17984	CP17985

ACCESSORIES AND FITTINGS

DESCRIPTION	PART NO
Wall mounting bracket for connecting unit For CP7980 and CP7988	CP7981
Upper part filter connecting unit	CP7978
Flush head for connecting unit	CP7987
Male connector, 1/4" w/dust filter	CP7986
Male connector, 1/8" w/dust filter	CP82117
Viton O-rings two sets	CP7983
Male connector, stainless steel, 1/4" w/dust filter	CP7986SS
Male connector, stainless steel, 1/8" w/dust filter	CP82117SS
Male connector, stainless steel, 3 mm w/dust filter	CP82117SS3
Male connector, stainless steel, 6 mm w/dust filter	CP7986SS6



Agilent Big Traps

➔ One Big Universal Trap unit will easily purify the contents of thirteen "K" size cylinders of 99.997% purity helium

Big Universal Traps utilize a layered, multi-adsorbent bed packing of the most effective, highest capacity adsorbent materials available today for the removal of oxygen, moisture, hydrocarbons, carbon dioxide, and carbon monoxide from helium gas streams. The volume of the various adsorbent materials in the Big Universal Trap was developed through rigorous testing and evaluation in order to ensure that breakthrough of the five major contaminant groups occurs as simultaneously as possible as each material achieves complete saturation.

Big Universal Traps are ideal for any GC or GC/MS application where helium is employed and assurance of purity is essential. Combining the contents of three individual in-line traps into a single unit reduces the number of potential leaks and the possibility of aspirating contaminants into the gas stream. A single purifier also simplifies installation and replacement.



BMT-2

TECH TIP

The effectiveness of the traps depends on the initial quality of the gas

AGILENT BIG TRAPS					
DESCRIPTION	CAPACITY	EFFICIENCY	1/8"	1/4"	REFILL 1500 CC
BIG UNIVERSAL TRAPS (RMS SERIES)					
Hydrogen	1.07 L O ₂ , 20 g THC*, 46 g H ₂ O	see effluent chart	RMSHY-2	RMSHY-4	—
Helium (Ar/Me)	1.07 L O ₂ , 20 g THC*, 46 g H ₂ O	see effluent chart	RMSH-2	RMSH-4	—
Nitrogen	1.07 L O ₂ , 20 g THC*, 46 g H ₂ O	see effluent chart	RMSN-2	RMSN-4	—
BIG TRAPS					
Big Moisture Trap	130 g H ₂ O	Reduction of H ₂ O to less than 5 µg/L	BMT-2	BMT-4	BMSR-1
Big Oxygen Trap	3 L O ₂ or 3.2 g	Reduction of O ₂ to less than 1 µg/L	BOT-2	BOT-4	—
Big Hydrocarbon Trap	80 g of medium to heavy molecular weight hydrocarbons	Reduction of C ₄ hydrocarbons to less than 15 µg/L	BHT-2	BHT-4	BACR
MOUNTING CLIPS					
Big Mounting Clip, 2/pk			UMC-5-2		

EFFLUENT CONCENTRATION FROM UNIVERSAL BIG TRAP

RESEARCH GRADE HELIUM, 99.9999%	
Impurities	< 1 mg/L
N ₂	< 0.5 mg/L
O ₂	< 0.5 mg/L
THC*	< 0.1 mg/L
CO+CO ₂	< 0.1 mg/L
H ₂ O	< 0.2 mg/L
H ₂	< 0.2 mg/L
Ar	< 0.1 mg/L
Ne	< 0.5 mg/L

*Total Hydrocarbons, analysis limited to three contaminant groups

Agilent Standard Size Gas Traps

AGILENT STANDARD SIZE IN-LINE GAS TRAPS						
DESCRIPTION	CAPACITY	EFFICIENCY	SIZE (cc)	1/8"	1/4"	REFILL 1 PINT
INDICATING TRAPS						
Glass Indicating Moisture Trap				5182-9211	5182-9411	—
Glass Indicating Oxygen Trap				5182-9201	5182-9401	—
Glass Indicating Oxygen Trap, Stainless Steel Fitting				5182-9202	5182-9402	—
NON-INDICATING TRAPS						
Oxygen Trap		< 1 µg/L	70	OT1-2	OT1-4	—
Hydrocarbon Trap			200	HT200-2	HT200-4	—
Capillary Grade Hydrocarbon Trap			100	HT3-2	HT3-4	ACR
Oxygen/Moisture Trap	500mL O ₂ or 2 g H ₂ O	<15 µg/L	100	OT3-2	OT3-4	—
Hydrocarbon/Moisture Trap			200	HMT200-2	HMT200-4	HCRMS
Mounting clip for Non-Indicating Traps				MC-1	MC-1	—
UNIVERSAL/EXTERNAL SPLIT VENT TRAP						
Universal/external split vent trap with 3 cartridges, 1/8" Swagelok fitting				RDT-1020	—	—
Replacement cartridges, 3/pk				RDT-1023	—	—

Glass Indicating Oxygen trap



Oxygen trap, OT1-2



Hydrocarbon trap, HT200-2



TECH TIP

Glass indicating oxygen trap is recommended as a downstream indicator for high-capacity traps

Restek Swagelok® Fittings

RESTEK SWAGELOK FITTINGS								
FITTING TYPE	SIZE	SWAGELOK #	QTY	PART NO	QTY	PART NO	QTY	PART NO
			Brass		316 Stainless Steel		Siltek/Sulfinert Treated	
Nut	1/16"	102-1	20/pk	RTK-23100	5/pk	RTK-23150	—	—
	1/8"	202-1	40/pk	RTK-23101	10/pk	RTK-23151	—	—
	1/4"	402-1	40/pk	RTK-23102	10/pk	RTK-23152	—	—
Front Ferrule	1/16"	103-1	20/pk	RTK-23103	10/pk	RTK-23153	—	—
	1/8"	203-1	40/pk	RTK-23104	20/pk	RTK-23154	—	—
	1/4"	403-1	40/pk	RTK-23105	20/pk	RTK-23155	—	—
Back Ferrule	1/16"	104-1	20/pk	RTK-23106	10/pk	RTK-23156	—	—
	1/8"	204-1	40/pk	RTK-23107	20/pk	RTK-23157	—	—
	1/4"	404-1	40/pk	RTK-23108	20/pk	RTK-23158	—	—
Nut & Ferrule Set	1/16"	—	10/pk	RTK-23109	2/pk	RTK-23159	—	—
	1/8"	—	20/pk	RTK-23110	5/pk	RTK-23160	—	—
	1/4"	—	20/pk	RTK-23111	5/pk	RTK-23161	—	—
Plug	1/16"	100-P	5/pk	RTK-23112	2/pk	RTK-23162	—	—
	1/8"	200-P	10/pk	RTK-23113	4-pk.	RTK-23163	ea	RTK-22573
	1/4"	400-P	10/pk	RTK-23114	4-pk.	RTK-23164	ea	RTK-22574
Union	1/16"	100-6	3/pk	RTK-23115	ea	RTK-23165	ea	RTK-22540
	1/8"	200-6	5/pk	RTK-23116	2/pk	RTK-23166	ea	RTK-22541
	1/4"	400-6	5/pk	RTK-23117	2/pk	RTK-23167	ea	RTK-22542
Reducing Union	1/8" to 1/16"	200-6-1	5/pk	RTK-23118	ea	RTK-23168	ea	RTK-22546
	1/4" to 1/16"	400-6-1	5/pk	RTK-23119	2/pk	RTK-23169	ea	RTK-22547
	1/4" to 1/8"	400-6-2	5/pk	RTK-23120	2/pk	RTK-23170	ea	RTK-22548
Tee	1/16"	100-3	2/pk	RTK-23121	ea	RTK-23171	ea	RTK-22543
	1/8"	200-3	2/pk	RTK-23122	ea	RTK-23172	ea	RTK-22544
	1/4"	400-3	2/pk	RTK-23123	ea	RTK-23173	ea	RTK-22545
Male Connector	1/8" to 1/4" NPT	200-1-4	10/pk	RTK-23136	2/pk	RTK-23186	ea	RTK-22564



Gas Management Accessories

MISCELLANEOUS GAS MANAGEMENT	
PART NO	DESCRIPTION
5180-4196	Pre-cleaned copper tubing, 1/8" OD, 2.1 mm ID, 50 ft length
5181-8836	Ceramic Wafer GC Column Cutter, 4/pk
TT-1008	Terry Tool tubing cutter for 1/8" with 3 replacement wheels
19251-00100	Angled wrench for split/splitless septum nut
8710-0806	Wrench, 1/2" and 7/16" (for typical 1/8" tube connections)
8710-1712	Adjustable wrench, 12", for use with regulators
9301-0985	FID Cleaning kit (improves sensitivity, reduces noise and decreases detector spiking)
5183-1941	Cylinder wall bracket with strap and chain (cylinder size up to 14")

TT-1008



9301-0985



5183-1941



Gas Generators

Parker Balston	400
Zero Air Generators	400
Ultra High Purity Hydrogen Generators for Fuel and Carrier Gas	401
Hydrogen Generators for Fuel Gas	401
Self Contained Membrane Nitrogen Generators	402
Membrane Nitrogen Generators	402
Ultra High Purity Nitrogen Generators	403
Makeup Gas Generators	404
FID Gas Stations	404
Halogenated Hydrocarbon Scrubber	405
Membrane Air Dryers	405

Featured Products

400 Zero Air Generators



402 Hydrogen Generators for Fuel Gas



401 Self Contained Membrane Nitrogen Generators



Notes from the Support Desk

In-house gas generators provide a number of significant benefits to the laboratory, including a dramatic improvement in safety, an increase in convenience, and a lower cost.

INSTRUMENT	GAS REQUIREMENTS	GAS PURITY REQUIREMENTS	FLOW RATES	GENERATOR RECOMMENDATION
Atmospheric Pressure Ionization (API-MS)	Air for Nebulizer Gas Nitrogen for Curtain, Sheath, and Shield gas	Clean, Dry, Hydrocarbon-free	<30 LPM	Zero Air Generator (HPZA-30000)
	Air for Nebulizer Gas Nitrogen for Curtain, Sheath, and Shield gas	99% or higher	<20 LPM	Nitrogen Generator (N2-14, N2-22, N2-35, NitroFlowLab)
Gas Chromatograph (GC) GC-FID	Zero Air as Flame Support Air	Clean, Hydrocarbon-free	150 – 600 cc/min	Zero Air Generator (HPZA-3500)
	Hydrogen as Flame Fuel Gas	Ultra High Purity	30 – 40 cc/min	Hydrogen Generator (H2PEM-260)
	Hydrogen as Capillary Carrier Gas	Ultra High Purity	Varies	Hydrogen Generator (H2PD-300)
	Nitrogen as Packed Carrier Gas	Ultra High Purity, Zero Grade	Varies	UHP Nitrogen Generator (UHPN2-1100)
	Nitrogen as Make up Gas	Ultra High Purity, Zero Grade	<100 cc/min	UHP Nitrogen Generator (UHPN2-1100)
GC-FPD	Zero Air as Flame Support Air	Clean, Hydrocarbon-free	<200 cc/min	Zero Air Generator (HPZA-3500)
	Hydrogen as Flame Fuel Gas	Ultra High Purity	50 – 70 cc/min	Hydrogen Generator (H2PEM-260)
	Hydrogen as Capillary Carrier Gas	Ultra High Purity	Varies	Hydrogen Generator (H2-1200)
	Nitrogen as Packed Carrier Gas	Ultra High Purity	Varies	UHP Nitrogen Generator (UHPN2-1100)
GC-NPD	Zero Air to Rubidium/Thermonic Bead	Dry, Clean, Hydrocarbon-Free	60 – 200 cc/min	Zero Air Generator (HPZA-3500)
	Hydrogen as Detector Support Gas	Ultra High Purity	<10 cc/min	Hydrogen Generator (H2PEM-100)
	Hydrogen as Capillary Carrier Gas	Ultra High Purity	Varies	Hydrogen Generator (Palladium) (H2PD-300)
	Nitrogen as Packed Carrier Gas	Ultra High Purity	Varies	UHP Nitrogen Generator (UHPN2-1100)
GC-ECD	Nitrogen as Carrier Gas	Ultra High Purity, Zero Grade	Varies	UHP Nitrogen Generator (UHPN2-1100)
	Nitrogen as Make up Gas	Ultra High Purity, Zero Grade	<100 cc/min	UHP Nitrogen Generator (UHPN2-1100)
GC-ELCD, HALL	Hydrogen as Reaction Gas	Ultra High Purity	70 – 200 cc/min	Hydrogen Generator (H2PD-300)
GC-TCD	Hydrogen as Carrier & Reference Gas	Ultra High Purity	Varies	Hydrogen Generator (H2PD-300)
LC/MS	Nitrogen as a Curtain Gas	LC/MS Grade	3 – 60 lpm	Nitrogen Generator (N2-14, N2-14ANA, NitroFlowLab) (N2-35, N2-35ANA)
ICP Spectrometer	Nitrogen as Optic/Camera Purge	Ultra High Purity	<1 – 5 lpm	Nitrogen Generator (76-97NA, 76-98NA)

Parker Balston Zero Air Generators

- ➔ Produce UHP zero air from house compressed air (<0.05 PPM THC)
- ➔ Eliminate inconvenient and dangerous zero air cylinders from the lab
- ➔ Qualitative smart-display provides operational status at a glance
- ➔ Recommended and used by many GC and column manufacturers
- ➔ Silent operation and minimal operator attention required



Parker Balston's Zero Air Generators are systems manufactured with state-of-the-art, highly reliable components engineered for easy installation, operation, and long term performance. Parker Balston's Zero Air Generators eliminate all the inconveniences and costs of cylinder gas supplies and dependence on outside vendors. Uncontrollable vendor price increases, contract negotiations, long term commitments and tank rentals are no longer a concern; Parker Balston Zero Air Generators offer long term cost stability. There is no need to use valuable laboratory floor space to store excessive reserves to protect yourself from late deliveries, transportation interruptions, or periods of tight supplies. With a Parker Balston Zero Air Generator, you control your supply.

NUMBER OF FIDs	PART NO
Up to 2	75-83NA
Up to 8	HPZA-3500
Up to 16	HPZA-7000
Up to 40	HPZA-18000
Up to 66	HPZA-30000

PARKER BALSTON ZERO AIR GENERATORS SPECIFICATIONS

OUTLET HYDROCARBON CONCENTRATION (AS METHANE)	MIN/MAX INLET AIR PRESSURE	MAX INLET HYDROCARBON CONCENTRATION (AS METHANE)	PRESSURE DROP AT MAX FLOW RATE
75-83NA, HPZA-30000: < 0.1 ppm HPZA-3500, HPZA-7000, HPZA-18000: < 0.05 ppm	40 PSI/125 PSI	100 ppm	4 PSI
MAX INLET AIR TEMPERATURE	INLET/OUTLET PORTS	DIMENSIONS (W X D X H)	SHIPPING WEIGHT
78 °F (26 °C)	1/4" NPT (female)	75-83NA: 10" x 3" x 12" (25 x 8 x 30 cm) HPZA-3500, HPZA-7000, HPZA-18000, HPZA-30000: 1" x 13" x 16" (27 x 34 x 42 cm)	75-83NA: 7 lbs (3 kg) HPZA-3500, HPZA-7000, HPZA-18000, HPZA-30000: 41 lbs (19 kg)

PARKER BALSTON ZERO AIR GENERATORS

FLOW RATE	1 LPM	3.5 LPM	7 LPM	18 LPM	30 LPM
PART NO	75-83NA	HPZA-3500	HPZA-7000	HPZA-18000	HPZA-30000
MAINTENANCE KIT	MK7583	MK7840	MK7840	MK7840	MK7840
INSTALLATION KIT	IK76803	IK76803	IK76803	IK76803	IK76803

Please call for a quote for Preventive Maintenance or Extended Warranty options

Parker Balston Ultra High Purity Hydrogen Generators for Fuel and Carrier Gas

- ➔ Cascading feature connects up to 32 hydrogen generators together to supply a large number of instruments
- ➔ Includes 3 year cell warranty
- ➔ Simple maintenance
- ➔ Eliminates cylinders
- ➔ Safe—produces only as much gas as you need
- ➔ Automatic water feed for continuous operation
- ➔ Remote PC monitoring features



PARKER BALSTON H2PEMPD SPECIFICATIONS

HYDROGEN PURITY	OXYGEN CONTENT	WATER CONTENT	POWER
99.99999+%	< 0.01 ppm	<1 ppm	100 – 230 VAC, 50/60 Hz
MAX OUTLET PRESSURE	OUTLET CONNECTION	DIMENSIONS	SHIPPING WEIGHT
100 or 175 PSI	1/4" compression	17.1" x 13.5" x 21"	60 lbs

TECH TIP

Delivery pressure of up to 175 PSI; ideal for high speed and fast GC applications.

PARKER BALSTON H2PEMPD HYDROGEN GENERATORS

FLOW RATE	510 cc/min	650 cc/min	850 cc/min	1100 cc/min	1300 cc/min
Max Outlet Pressure to 100 PSI (6.8 bar)	H2PEMPD-510-100	H2PEMPD-650-100	H2PEMPD-850-100	H2PEMPD-1100-100	H2PEMPD-1300-100
Max Outlet Pressure to 175 PSI (11.9 bar)	H2PEMPD-510-175	H2PEMPD-650-175	H2PEMPD-850-175	H2PEMPD-1100-175	H2PEMPD-1300-175

6 MONTH SERVICE KIT¹

MKH2PEMPD-6M

24 MONTH SERVICE KIT²

MKH2PEMPD-24M

Certified for laboratory use by CSA, IEC 1010, and CE Mark

Please call for a quote for Preventive Maintenance or Extended Warranty options

1) Includes Deionizer cartridge, 100 µm Water filter, (2) Environmental filters, and Filter replacement tool

2) Includes Deionizer cartridge, 100 µm Water filter, (2) Environmental filters, Filter replacement tool, Tube clamp, Water pump, and (2) Fan guards

Parker Balston Hydrogen Generators for Fuel Gas

- ➔ Ideal for fuel gas, up to 14 FID's
- ➔ Includes 2 year cell warranty
- ➔ Eliminates dangerous and expensive hydrogen gas cylinders
- ➔ Exclusive water management system and control circuitry maximize uptime
- ➔ Unique display lighting changes color for easy status checks
- ➔ Remote control and remote monitoring capable
- ➔ Compact and reliable—only one square foot of bench space required
- ➔ No liquid caustics



PARKER BALSTON H2PEM SPECIFICATIONS

HYDROGEN PURITY	OUTLET PORT	DELIVERY PRESSURE
99.9995+%	1/8" compression	5 – 100 PSI ± 0.5 PSI
POWER	DIMENSIONS	SHIPPING WEIGHT
100 – 230 VAC	17.1" x 13.5" x 18"	59 lb

PARKER BALSTON H2PEM GENERATORS

FLOW RATE	100 cc/min	165 cc/min	260 cc/min	510 cc/min
PART NO	H2PEM-100	H2PEM-165	H2PEM-260	H2PEM-510

DESICCANT CARTRIDGE (1/EA)

MKH2PEM-D

6 MONTH SERVICE KIT¹

MKH2PEM-6M

24 MONTH SERVICE KIT²

MKH2PEM-24M

1) Includes Deionizer Cartridge, Water Filter, and (3) Environmental Filters

2) Includes Deionizer Cartridge, Water Filter, (3) Environmental Filters, Float, Water Pump, Desiccant Cartridge, and Service Reset Dongle

Parker Balston LC/MS NitroFlow Self Contained Membrane Nitrogen Generators

- 3 year limited compressor warranty
- Nearly silent operation; operates at less than 49 dB(a)



- 2 year compressor warranty
- Includes state-of-the-art, oil-less compressors



PARKER BALSTON NITROFLOW 60/NITROFLOW 60D SPECIFICATIONS			
NITROGEN	HYDROCARBON	PHTHALATE FREE	ATMOSPHERIC DEW POINT
Up to 60 LPM	Yes	Yes	-58 °F
OUTLET PORT	MAX OUTLET PRESSURE	MIN/MAX AMBIENT TEMP	DIMENSIONS
Female 1/4" NPT	100 PSI	50 °F/95 °F	43" x 21" x 34"
SHIPPING WEIGHT	DRY AIR FLOW	DRY AIR DEW POINT	POWER
643 lbs	5 SLPM (60D only)	-40 °F (-40 °C) (60D only)	195-254 VAC, 60 Hz, 1 Phase, 14A, 230 VAC, 50 Hz, 1 Phase, 13A

PARKER BALSTON NITROFLOW LAB SPECIFICATIONS			
NITROGEN	HYDROCARBON FREE	PHTHALATE FREE	ATMOSPHERIC DEW POINT
Up to 30 LPM	<2 ppm (excluding methane)	Yes	-58 °F
MAX OUTLET PRESSURE	OUTLET PORT	SHIPPING WEIGHT	MIN/MAX AMBIENT TEMP
116 PSI	Female 1/4" NPT	204 lbs	50 °F/95 °F
DIMENSIONS	POWER		
28" x 12" x 35"	120 VAC, 60 Hz, 20 Amp		

PARKER BALSTON NITROFLOW GENERATORS	
DESCRIPTION	PART NO
Nitroflow Generator, 30 LPM	NITROFLOW
Nitroflow Generator, 60 LPM	NITROFLOW60
Nitroflow Generator, 60 LPM w/dryer	NITROFLOW60D

Please call for a quote for Preventive Maintenance or Extended Warranty options

Parker Balston Membrane Nitrogen Generators

- Recommended and used by all major LC/MS manufacturers



The purity level of the nitrogen stream is defined by the user, for the application, and may range from 95% to 99.5%.

PARKER BALSTON MEMBRANE NITROGEN SPECIFICATIONS			
SUSPENDED LIQUIDS	PARTICLES > 0.01 µm	ATMOSPHERIC DEW POINT	NITROGEN PURITY
None	None	95.0% – 99.5%	95.0% – 99.5%
PHTHALATE FREE	HYDROCARBON-FREE	MAX INLET AIR TEMP	AMBIENT TEMP
Yes	Yes	110 °F	68 – 72 °F
COMMERCIALY STERILE	MIN/MAX OPERATING PRESSURE	MAX PRESS DROP @99% N2 PURITY, 125 PSI	POWER (ANA MODELS ONLY)
Yes	60/145 PSI	10 PSI	120 VAC, 60 Hz, 25W

PARKER BALSTON MEMBRANE NITROGEN GENERATORS						
NITROGEN FLOW RATE*			SHIPPING WEIGHT	DIMENSIONS	PORTS	PART NO
@ 100 PSI, 99%	@ 90 PSI, 99%	@ 80 PSI, 99%				
4 LPM	4 LPM	3 LPM	42.5 lbs	16" x 11" x 13"	1/4" NPT	N2-04
13 LPM	11 LPM	10 LPM	80 lbs	52" x 18" x 16"	1/4" NPT	N2-14
20 LPM	18 LPM	15 LPM	80 lbs	52" x 18" x 16"	1/4" NPT	N2-22
30 LPM	27 LPM	23 LPM	90 lbs	52" x 18" x 16"	1/4" NPT	N2-35
53 LPM	44 LPM	35 LPM	250 lbs	67" x 24" x 20"	1/2" NPT	N2-45
79 LPM	66 LPM	53 LPM	250 lbs	67" x 24" x 20"	1/2" NPT	N2-80
106 LPM	89 LPM	71 LPM	250 lbs	67" x 24" x 20"	1/2" NPT	N2-135

*Flow rate is dependent on incoming air pressure and the purity level of the nitrogen stream selected. Please call for a quote for Preventative Maintenance or Extended Warranty options

Parker Balston Ultra High Purity Nitrogen Generators

- ➔ Produce a continuous supply of high purity nitrogen gas from existing compressed air
- ➔ Eliminate the need for costly dangerous, inconvenient nitrogen cylinders
- ➔ Compact design frees up valuable laboratory floor space
- ➔ Offers long term cost stability—uncontrollable vendor price increases, contract negotiations, long term commitments and tank rentals are no longer a concern
- ➔ Ideal for carrier gas applications



PARKER BALSTON UHPN2-1100 SPECIFICATIONS			
NITROGEN PURITY	CO CONCENTRATION	CO ₂ CONCENTRATION	O ₂ CONCENTRATION
99.9999%	< 1 ppm	< 1 ppm	< 1 ppm
H ₂ O CONCENTRATION	HYDROCARBON CONCENTRATION	ARGON CONCENTRATION	MIN/MAX INLET PRESSURE
< 1 ppm	< 0.1 ppm	0.9%	60 PSI/125 PSI
REC. INLET TEMP	AMBIENT OPERATING TEMP	MAX AIR CONSUMPTION	INLET CONNECTION
78 °F (25 °C)	60 °F – 100 °F (16 °C – 38 °C)	42 LPM (1.5 scfm)	1/4" NPT (female)
OUTLET CONNECTION	POWER	DIMENSIONS	SHIPPING WEIGHT
1/8" compression	120 VAC/60 Hz	12" x 16" d x 35" h	110 lbs (50 kg)

INLET AIR PRESSURE (PSI)	MAX OUTLET FLOW (cc/min)	MAX OUTLET PRESSURE (PSI)
125	1100	85
110	1000	75
100	900	65
90	800	60
80	700	50
70	600	45
60	500	35

PARKER BALSTON ULTRA HIGH PURITY NITROGEN GENERATORS	
DESCRIPTION	PART NO
UHP NITROGEN Generator	UHPN2-1100

TECH TIP | Parker Balston Extended Support Programs

Parker Balston plans range from the standard Depot class of support to the exclusive Express class of support. Both types of plans are convenient and are designed to match your needs and budget. Parker Balston Extended Support Plans are smart to select when you depend upon high performance analytical equipment. Our exclusive Express support program offers the piece-of-mind of a new or like new replacement generator arriving at your door the very next business morning.

PARKER BALSTON EXTENDED SUPPORT PROGRAMS		
	EXPRESS (EN2)	DEPOT (DN2)
Next day delivery of new or like new temporary replacement unit	●	N/A
Extends warranty coverage to 24 months	●	●
Covers replacement parts for repair	●	●
Covers labor charges for repair	●	●
Covers packaging material for repair	●	●
Covers freight charges for repair	●	●

Parker Balston Makeup Gas Generators & FID Gas Stations

Makeup Gas Generator | Produces Makeup Grade Nitrogen

- ➔ Ideal for up to 5 – 6 FIDs
- ➔ In addition to nitrogen, Model MGG-2500NA also produces 2500 cc/min zero air
- ➔ Eliminates dangerous and costly helium or nitrogen cylinders from the laboratory
- ➔ Improves flame shape within the FID detector and maximizes sensitivity
- ➔ Recommended and used by many GC and column manufacturers
- ➔ Typical payback period of less than one year
- ➔ Silent operation and minimal operator attention required



PARKER BALSTON MAKEUP GAS GENERATOR SPECIFICATIONS

NITROGEN PURITY		ZERO AIR PURITY	
99.9999+ % (with respect to hydrocarbons) 99+ % (with respect to oxygen)		MGG-2500NA Only : <0.05 ppm (total hydrocarbon as methane)	
NITROGEN OUTLET PRESSURE	ZERO AIR OUTLET PRESSURE	CERTIFICATIONS	POWER
60 – 100 PSI	MGG-2500NA Only: 60 – 100 PSI	IEC 1010-1; CSA 1010; UL 3101; CE Mark	120 VAC, 60 Hz
INLET PORT	OUTLET PORTS	DIMENSIONS	SHIPPING WEIGHT
1/4" NPT (female)	1/4" NPT (female)	7" x 26" x 16.5" (18 x 66 x 42 cm)	60 lbs / 27 kg

PARKER BALSTON MAKEUP GAS GENERATORS

Max Nitrogen Flow Rate	400 cc/min	400 cc/min
Max Zero Air Flow Rate	N/A	2500 cc/min
PART NO	MGG-400NA	MGG-2500NA
ANNUAL MAINTENANCE KIT	MKMGG2500-12	MKMGG2500-12

Please call for a quote for Preventive Maintenance or Extended Warranty options

FID Gas Station | Produces UHP Zero Air & Hydrogen Gas

- ➔ Produces UHP zero air from house compressed air and 99.9995% pure hydrogen gas
- ➔ Eliminate inconvenient and dangerous zero air and hydrogen cylinders
- ➔ Increases accuracy of analysis and reduces the cleaning requirement of the detector
- ➔ Recommended and used by many GC and column manufacturers
- ➔ Payback period of typically less than one year
- ➔ Automatic water fill
- ➔ Silent operation and minimal operator attention required



PARKER BALSTON FID GAS STATION SPECIFICATIONS

ZERO AIR PURITY	ZERO AIR OUTLET PRESSURE	HYDROGEN PURITY	HYDROGEN OUTLET PRESSURE
<0.1 ppm (total hydrocarbon as methane)	40 – 125 PSI	99.9995%	60 PSI
CERTIFICATIONS	POWER	INLET PORT	OUTLET PORTS
IEC 1010-1; CSA 1010; UL 3101; CE Mark	120 VAC, 60 Hz	1/4" NPT (female) compressed air supply	1/8" Compression
DIMENSIONS	SHIPPING WEIGHT		
10.5" x 17" x 16.5" (27 x 43 x 42 cm)	53 lbs / 24 kg		

PARKER BALSTON FID GAS GENERATORS

MAX NITROGEN FLOW RATE	90 cc/min	250 cc/min
MAX HYDROGEN FLOW RATE	1,000 cc/min	2500 cc/min
PART NO	FID-1000NA	FID-2500NA
INSTALLATION SERVICE	FID-1000-INST	FID-2500-INST
ANNUAL MAINTENANCE KIT	MKFID1000	MKFID1000

Please call for a quote for Preventive Maintenance or Extended Warranty options

Parker Balston Halogenated Hydrocarbon Scrubber

- ➔ Ideal for removing halogenated hydrocarbons from compressed air
- ➔ Extended-life adsorbent requiring minimal maintenance
- ➔ Protects equipment from chlorinated solvent vapors
- ➔ Purified bulk inert non-corrosive gases

Parker Balston Halogenated Hydrocarbon Scrubbers effectively remove halogenated hydrocarbons from an existing compressed air supply. The scrubber can be used with any Parker Balston Zero Air Generator or UHP Nitrogen Generator if the compressed air supply contained halogenated hydrocarbons.



PARKER BALSTON 76080 HALOGENATED HYDROCARBON SCRUBBER SPECIFICATIONS

MIN/MAX PRESSURE	INLET/OUTLET PORTS	CHANGE FREQUENCY AT 17 LPM
60 PSI – 125 PSI	1/4" NPT (female)	18 Months
DIMENSIONS (h x w x d)	SHIPPING WEIGHT	
41" x 15" x 8"	29 lbs	

PARKER BALSTON HALOGENATED HYDROCARBON SCRUBBER

DESCRIPTION	PART NO
Halogenated hydrocarbon scrubber	76080

Parker Balston Laboratory Membrane Air Dryers

- ➔ Low dewpoint instrument air—prevents analytical instrument contamination
- ➔ Dry air for hazardous areas
- ➔ No electricity required—low operating costs
- ➔ No refrigerants or freons—environmentally sound
- ➔ Explosion proof
- ➔ No moving parts or motors—silent operation



PARKER BALSTON MEMBRANE AIR DRYER SPECIFICATIONS

MIN/MAX INLET AIR TEMP	RECOMMENDED OPERATING TEMP RANGE	MIN/MAX INLET PRESSURE	MAX PRESSURE DROP
-40 °F/140 °F	60 °F – 100 °F	60 PSI/150 PSI	< 4 PSI
WALL MOUNTABLE	INLET/OUTLET PORT SIZE	SHIPPING WEIGHT	DIMENSIONS (w x h x d)
Yes	64-01, 64-02: 1/4" NPT (female) 64-10: 1/2" NPT (female)	64-01: 9 lbs (4 kg) 64-02: 10 lbs (5 kg) 64-10: 18 lbs (9 kg)	64-01: 6" x 22" x 5" 64-02: 6" x 23" x 5" 64-10: 6" x 37" x 5"

PARKER BALSTON MEMBRANE AIR DRYERS

MAX FLOW RATE AT -40 °F DEWPOINT	2 LPM	57 LPM	283 LPM
MAX FLOW RATE AT 32 °F DEWPOINT	71 LPM	142 LPM	708 LPM
PART NO	64-01	64-02	64-10
ANNUAL MAINTENANCE KIT	MK7601	MK7601	MK7610

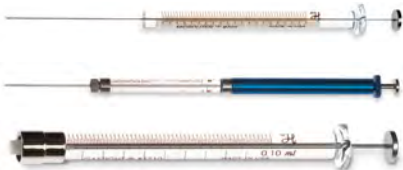
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HAMILTON 

Featured Products

408 Hamilton Syringes



416 Hamilton Syringe Accessories

Reproducibility (Chaney) Adapter

Improve the reproducibility of multiple manual injections with the Chaney Adapter.



Calibrated Syringe

A Certificate of Calibration is provided with the product and the procedure is performed with an unbroken chain of calibrations traceable to N.I.S.T. procedure

Digital Syringe™



422 Hamilton SoftGrip Pipettes



426 Hamilton MicroLab 600 Diluters & Dispensers

- Reduce time preparing samples or dispensing reagents
- Minimize experimental variation from one user to the next
- Manage log files from any PC
- Comply with EPA, FDA GLP and GMP, 21 CFR Part 11, and ISO
- N.I.S.T. traceable calibration



Notes from the Support Desk

Hamilton Syringe FAQ

What is the accuracy of Hamilton syringes?

Hamilton syringes are manufactured to be accurate within $\pm 1\%$ of nominal volume, and with precision within 1%, measured at 80% of total scale volume. The design of our barrel and plunger dimensions assures high levels of accuracy and precision. The Hamilton Company Quality System is ISO 9001-2008 certified.

Can Hamilton syringes be used on humans?

Hamilton syringes are not manufactured for human use. To discuss potential off label uses for Hamilton syringes please contact us.

Is the volume of fluid in the needle part of the total volume of the dispensed fluid?

When using a Hamilton syringe, the volume in the needle (called dead volume) is considered constant and the volume being dispensed is absolute. The same dead volume is maintained throughout aspirate and dispense stages.

What are the most versatile syringes made by Hamilton?

Gastight syringes are the most versatile syringes. Plungers are replaceable if they get bent. Any of the Metal hub, Kel-F or Removable needle allow for the replacement of needle if they become bent or plugged.

How can I sterilize my syringe?

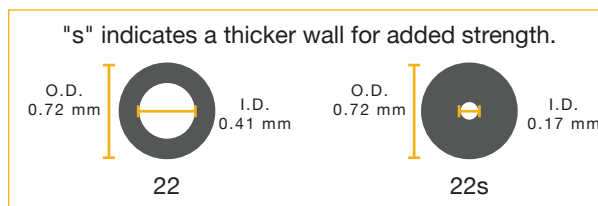
Chemical sterilization is the preferred method for all Hamilton products. Autoclaving syringes should only be used as a last resort and only where specifically stated. Syringe sterilization is not straightforward. Not all syringes can be autoclaved.

Is the Digital Syringe automated or manual?

The Digital Syringe is a manual syringe with a digital display which allows you to clearly see the aspirated volume. The Digital Syringe is not automated, it will not dispense with the touch of a button. It operates like a typical syringe, but there is no guessing as to the volume being aspirated or dispensed.





What does the "s" mean in a 22s or 26s gauge needle?

The "s" represents a smaller ID for the needle and a thicker needle wall for better durability. For example, a 26 gauge needle has an OD of 0.46 mm and an ID of 0.26 mm while the 26s gauge needle has an OD of 0.47 mm and an ID of 0.13 mm. The 26s has half the ID of the 26 gauge needle. The difference in the wall thickness also nearly doubled with 26s gauge having a thickness of 0.18 mm while the 26 gauge is only 0.10 mm.



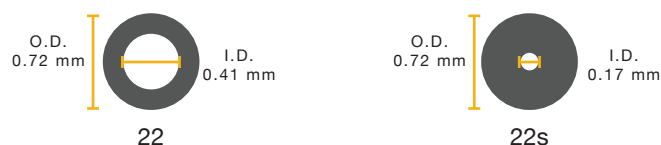
Hamilton Manual Syringes

Standard Needle Point Styles

POINT STYLE	DESCRIPTION	APPLICATION
2 	10–12° sharp, beveled, curved non-coloring	Gas chromatography, septum piercing
3 	Blunt, electro-polished	HPLC injection, thin-layer chromatography (TLC), general liquid handling
5 	Conical with side port for penetration without coring	Headspace, applications prone to needle clogging, minimal septum damage
AS 	Conical, non coring designed to withstand multiple injections	Autosampler injection, pre-pierced septa










Needle Gauge

"s" indicates a thicker wall for added strength.



GAUGE	O.D. (mm)	I.D. (mm)
32	0.24	0.11
26s	0.47	0.13
25	0.51	0.26
24	0.57	0.31
23	0.64	0.34
22s	0.72	0.17
22	0.72	0.41

Syringe Terminations

TERMINATION	REMARK	AUTOCLAVABLE
Cemented Needle (N) 	For low-volume syringes	No
Luer Tip Cemented Needle (LTN) 	For mid-volume syringes	No
Removable Needle (RN) 		Yes if disassembled
Knurled Hub (KH) 	For Modified Microliter syringes only	Yes if disassembled
Luer Tip (LT) 		Yes if disassembled
PTFE Luer Lock (TLL) 		Yes if disassembled
SampleLock™ (SL) 	Integrated on/off valve	No
Fixed Needle (FN) 	Found on CTC C-Line and X-Type syringes	No
ChemSeal™ (C) 	1/4" – 28 UNF/ threaded connection	Yes if disassembled

Hamilton Syringe Series Guide

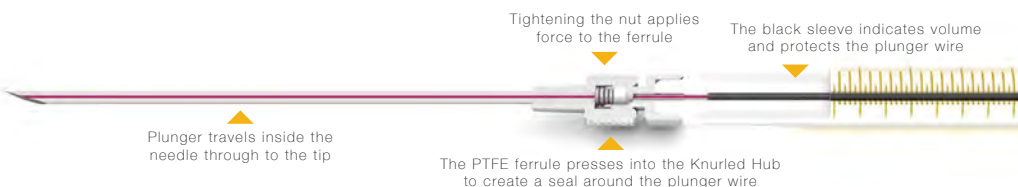
The key to selecting the right syringe for your application is to identify your sample type and determine the smallest volume to be dispensed or injected. Hamilton offers two type of syringes, Gastight® and Microliter™, which differ in the design of the plunger.

SYRINGE SERIES	VOLUME	SYRINGE TYPE	PLUNGER TYPE	PAGE NO
7000	0.5 µL – 5 µL	Modified Microliter	Tungsten	409
600	2.5 µL – 5 µL	Microliter	Reinforced stainless steel fitted	409
700	5 µL – 500 µL	Microliter	Stainless steel fitted	410
800	5 µL – 250 µL	Microliter	Reinforced stainless steel fitted	411
900	5 µL – 10 µL	Microliter	Reinforced stainless steel fitted	411
1700	10 µL – 500 µL	Gastight	PTFE tipped	412
1000	1 mL – 100 mL	Gastight	PTFE tipped	413
1800	10 µL – 250 µL	Gastight	Reinforced PTFE tipped	414
Super Syringe	0.5 L – 2 L	Gastight	Acrylic plunger with Buna-N O-ring	414

Hamilton Modified Microliter Syringes | 7000 Series



These syringes are designed to dispense volumes below 5 µL. This requires an extremely small tungsten plunger wire that travels to the tip of the needle. The resulting design has zero dead volume and is accurate below 50 nL. The 7000 series syringe is used for dispensing minute liquid volumes and features a Modified Microliter design. The series employs a plunger wire inside the needle to accurately dispense ultra-low volumes. The needle is bored to extremely accurate tolerances to accommodate the plunger wire. With the plunger inside the needle, the standard dead volume inside the needle is eliminated.



HAMILTON 7000 SERIES

		VOLUME	0.5 µL	0.5 µL	1 µL	1 µL	2 µL	2 µL	5 µL
		MODEL	7000.5	7000.5	7001	7101	7002	7102	7105
		GAUGE	32	25	25	22	25	23	24
Knurled Hub		Knurled Hub (KH) Syringe (point style 2)	N/A	86259	80135	86211	88411	88511	88011
		Knurled Hub (KH) Syringe (point style 3)	86257 ¹	86250	80100	86200	88400	88500	88000
ACCESSORIES (Syringe not included)									
		Reproducibility Adapter	14725	14725	14725	14725	14725	14725	14725
		Syringe Guide	14906	14906	14906	14906	14906	14906	14906
		Digital Syringe	Add the prefix "DS" to the beginning of the syringe's part number. (Base unit not sold separately)						

For Syringe Calibration Service, add the prefix "CAL" to the beginning of the syringe's part number.

Note: Needles are 70 mm; Max temperature: 239 °F (115 °C); Max pressure: 6,000 PSI

1) Needle length is 100 mm

Hamilton Microliter Syringes | 600 Series



The 600 series are robust syringes consisting of two distinct parts. The bottom half of the barrel accurately measures the liquid sample and the top half supports the plunger. In addition, the top section of the plunger is thicker to further reduce the risk of bending the plunger. These syringes require half of the standard stroke length making them ideal for one-handed operation. The plungers and barrels are not interchangeable or replaceable.

HAMILTON 600 SERIES

		VOLUME	2.5 µL	5 µL
		MODEL	62	65
		GAUGE	22s	22s
Removable Needle Syringes & Repl. Needles		Removable Needle (RN) Syringe (point style 3)	87942	87943
		Removable Needle (RN) Syringe (needle sold separately)	7632-01	7633-01
		Replacement Needles (sold separately)	Point Style	Small RN
			2	7758-03
		3	7770-01	
		5	7784-05	

Recommended Use: The 600 series is great for animal injections because one hand is free for manipulating the animal.

For Syringe Calibration Service, add the prefix "CAL" to the beginning of the syringe's part number.

Note: Needles are 51 mm; Max temperature: 239 °F (115 °C); Max pressure: 2,000 PSI

Hamilton Microliter Syringes | 700 Series



HAMILTON 700 SERIES																																												
		VOLUME	5 μ L	10 μ L	25 μ L	50 μ L	100 μ L	250 μ L	500 μ L																																			
<p>"s" indicates thicker wall for added strength</p>		MODEL	75	701	702	705	710	725	750																																			
		GAUGE	26s	26s	22s	22s	22s	22s	22																																			
		LENGTH	55 mm	55 mm	55 mm	55 mm	55 mm	55 mm	55 mm																																			
Cemented Needle Syringes		Cemented Needle (N) Syringe (point style 2)	87900	80300 80366 (6/pk)	80400	80500	80600	80700	80800																																			
		Cemented Needle (N) Syringe (point style 3)	87919	80383 80365 ²	80465	80565	80665	80765 ¹	80865																																			
		Cemented Needle (N) Syringe (specify needle)	87908	80308	80408	80508	80608	80708	80808																																			
Removable Needle Syringes & Repl. Needles		Removable Needle (RN) Syringe (point style 2)	87930	80330 80336 (6/pk)	80430	80530	80630	80730	80830																																			
		Removable Needle (RN) Syringe (needle sold separately)	7634-01	7635-01	7636-01	7637-01	7638-01	7639-01	7640-01																																			
		<table border="1"> <thead> <tr> <th>Replacement RN Needles (sold separately)</th> <th>Point Style</th> <th>Small RN</th> <th>Small RN</th> <th>Small RN</th> <th>Small RN</th> <th>Small RN</th> <th>Large RN</th> <th>Large RN</th> </tr> </thead> <tbody> <tr> <td></td> <td>2</td> <td>7758-02</td> <td>7758-02</td> <td>7758-03</td> <td>7758-03</td> <td>7758-03</td> <td>7779-03</td> <td>7779-01</td> </tr> <tr> <td></td> <td>3</td> <td>7768-01</td> <td>7768-01</td> <td>7770-01</td> <td>7770-01</td> <td>7770-01</td> <td>7780-03</td> <td>7780-04</td> </tr> <tr> <td></td> <td>5</td> <td>7784-07</td> <td>7784-07</td> <td>7784-05</td> <td>7784-05</td> <td>7784-05</td> <td>7784-01</td> <td>7784-02</td> </tr> </tbody> </table>	Replacement RN Needles (sold separately)	Point Style	Small RN	Small RN	Small RN	Small RN	Small RN	Large RN	Large RN		2	7758-02	7758-02	7758-03	7758-03	7758-03	7779-03	7779-01		3	7768-01	7768-01	7770-01	7770-01	7770-01	7780-03	7780-04		5	7784-07	7784-07	7784-05	7784-05	7784-05	7784-01	7784-02						
Replacement RN Needles (sold separately)	Point Style	Small RN	Small RN	Small RN	Small RN	Small RN	Large RN	Large RN																																				
	2	7758-02	7758-02	7758-03	7758-03	7758-03	7779-03	7779-01																																				
	3	7768-01	7768-01	7770-01	7770-01	7770-01	7780-03	7780-04																																				
	5	7784-07	7784-07	7784-05	7784-05	7784-05	7784-01	7784-02																																				
Luer Tip Syringes & Repl. Needles		Luer Tip (LT) Syringe (needle sold separately)	N/A	80301	80401	80501	80601	80701	80801																																			
		<table border="1"> <thead> <tr> <th>Replacement Hub Needles (sold separately)</th> <th>Point Style</th> <th>Kel-F Hub</th> <th>Kel-F Hub</th> <th>Kel-F Hub</th> <th>Kel-F Hub</th> <th>Kel-F Hub</th> <th>Kel-F Hub</th> <th>Kel-F Hub</th> </tr> </thead> <tbody> <tr> <td></td> <td>2</td> <td>90139</td> <td>90138</td> <td>90138</td> <td>90138</td> <td>90138</td> <td>90138</td> <td>90122</td> </tr> <tr> <td></td> <td>3</td> <td>90539</td> <td>90534</td> <td>90534</td> <td>90534</td> <td>90534</td> <td>90534</td> <td>90134</td> </tr> <tr> <td></td> <td>5</td> <td>7746-12</td> <td>7746-11</td> <td>7746-11</td> <td>7746-11</td> <td>7746-11</td> <td>7746-11</td> <td>7746-06</td> </tr> </tbody> </table>	Replacement Hub Needles (sold separately)	Point Style	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub		2	90139	90138	90138	90138	90138	90138	90122		3	90539	90534	90534	90534	90534	90534	90134		5	7746-12	7746-11	7746-11	7746-11	7746-11	7746-11	7746-06						
	Replacement Hub Needles (sold separately)	Point Style	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub																																			
	2	90139	90138	90138	90138	90138	90138	90122																																				
	3	90539	90534	90534	90534	90534	90534	90134																																				
	5	7746-12	7746-11	7746-11	7746-11	7746-11	7746-11	7746-06																																				
ACCESSORIES (Syringe not included)																																												
PB600 Repeating Dispenser			N/A	N/A	83700	83700	83700	83700	83700																																			
Reproducibility (Chaney) Adapter			14700	14700	14725	14725	14725	14725	14725																																			
Syringe Guide			14806	14806	14906	14906	14906	14906	14906																																			
Digital Base Unit			Add the prefix "DS" to the beginning of the syringe's part number. (Base unit not sold separately)																																									

1) 22 gauge 2) 22s gauge

For Syringe Calibration Service, add the prefix "CAL" to the beginning of the syringe's part number.

Note: Max temperature: Cemented Needle: 122 °F (50 °C), All others: 239 °F (115 °C) Max pressure: 5 – 100 μ L: 2,000 PSI, All others: 1,000 PSI

Digital Syringe™



Reproducibility (Chaney) Adapter

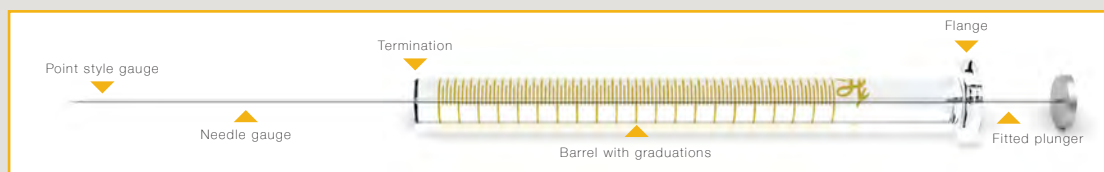


Syringe Guide



Microliter Syringes | 600, 700, 800 and 900 Series

Microliter syringes are for use with liquids and incorporates a stainless steel plunger that is individually fitted to its matching syringe barrel (they are not interchangeable — be very careful to keep each plunger with its original syringe). These micro-volume syringes have a very close tolerance between the plunger and the barrel which creates a liquid-tight seal without parts such as O-rings that eventually wear out. These syringes are ideal for aqueous and organics samples that are not prone to precipitation, crystallization or bonding with glass.



Hamilton Microliter Syringes | 800 Series



The 800 series syringes are a reinforced plunger version of the 700 series. The 800 series has the same liquid handling capabilities as the 700 series, but with the addition of a blue removable aluminum syringe holder that attaches to the flange of the syringe. The syringe holder prevents heat transfer, dispense inaccuracies, plunger blow outs and plunger bending during injection. A two-piece extended plunger further eliminates the risk of breakage. A friction screw at the top of the barrel can be adjusted to give the user some control over dispensing speed and prevent the accidental removal of the plunger. In addition, the syringe holder can be fitted with different barrel/plunger assemblies to cover a range of volumes.

Recommended Use: This syringe is intended for applications where the plunger on a 700 series syringe might be bent. Excellent for novice users.

HAMILTON 800 SERIES

		VOLUME	5 μ L	10 μ L	25 μ L	50 μ L	100 μ L	250 μ L	
 22 22s "s" indicates thicker wall for added strength	MODEL		85	801	802	805	810	825	
	GAUGE		26s	26s	22s	22s	22s	22s	
Removable Needle Syringes & Repl. Needles	 Cemented Needle (N) Syringe (point style 2)		84850	84852	84854	84856	84858	N/A	
	 Removable Needle (RN) Syringe (point style 2)		84851	84853	84855	84857	84859	84861	
	 Removable Needle (RN) Syringe (needle sold separately)		7641-01	7642-01	7643-01	7644-01	7645-01	7646-01	
	 Replacement Needles (sold separately)	Point Style		Small RN	Small RN	Small RN	Small RN	Small RN	Large RN
			2	7758-02	7758-02	7758-03	7758-03	7758-03	7779-03
			3	7768-01	7768-01	7770-01	7770-01	7770-01	7780-03
			5	7784-07	7784-07	7784-05	7784-05	7784-05	7784-01
ACCESSORIES (Syringe not included)									
Reproducibility (Chaney) Adapter			32146	32146	32146	32146	32146	32146	

For Syringe Calibration Service, add the prefix "CAL" to the beginning of the syringe's part number.

Note: Needles are 51 mm; Max temperature: Cemented Needle: 122° F (50° C) All others: 239° F (115° C); Max pressure: 2,000 PSI

Hamilton Microliter Syringes | 900 Series



The 900 series has the same liquid handling capabilities as the 800 series but is a more economical version. The 900 series does not have any replaceable parts making the initial cost less than the 800 series.

HAMILTON 900 SERIES

		VOLUME	5 μ L	10 μ L	
 22 22s "s" indicates thicker wall for added strength	MODEL		95	901	
	GAUGE		26s	26s	
Removable Needle Syringes & Repl. Needles	 Cemented Needle (N) Syringe (point style 2)		87920	80360	
	 Removable Needle (RN) Syringe (point style 2)		87925	80370	
	 Removable Needle (RN) Syringe (needle sold separately)		7647-01	7648-01	
	 Replacement Needles (sold separately)	Point Style		Small RN	Small RN
			2	7758-02	7758-02
			3	7768-01	7768-01
			5	7784-07	7784-07
ACCESSORIES (Syringe not included)					
Reproducibility (Chaney) Adapter			32148	32148	

Recommended Use: This syringe is perfect when a robust syringe is desired and budget is a consideration.

Reproducibility (Chaney) Adapter



For Syringe Calibration Service, add the prefix "CAL" to the beginning of the syringe's part number.

Note: Needles are 51 mm; Max temperature: Cemented Needle: 122° F (50° C)

Removable Needle: 239° F (115° C); Max pressure: 2,000 PSI

Hamilton Gastight Syringes | 1700 Series



HAMILTON 1700 SERIES		VOLUME	10 µL	25 µL	50 µL	100 µL	250 µL	500 µL
22 22s "s" indicates thicker wall for added strength	MODEL	1701	1702	1705	1710	1725	1750	
	GAUGE	26s	22s	22s	22s	22s	22	
	LENGTH	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm	
Cemented Needle Syringes	Cemented Needle (N) Syringe (point style 2)	80000	80200	80900	81000	81100 ¹	81217 ¹	
	Cemented Needle (N) Syringe (point style 3)	80075	80275	80975	81075	81175 ¹	81216 ¹	
	Cemented Needle (N) Syringe (specify needle)	80008	80208	80908	81008	81108 ¹	81214 ¹	
Removable Needle Syringes & Repl. Needles	Removable Needle (RN) Syringe (point style 2)	80030	80230	80930	81030	81130	81230	
	Removable Needle (RN) Syringe (point style 3)	80065 ²	80265	80965	81065	81165 ³	81265	
	Removable Needle (RN) Syringe (needle sold separately)	7653-01	7654-01	7655-01	7656-01	7657-01	7658-01	
	Replacement Needles (sold separately)	Point Style	Small RN	Small RN	Small RN	Small RN	Large RN	Large RN
		2	7758-02	7758-03	7758-03	7758-03	7779-03	7779-01
		3	7768-01	7770-01	7770-01	7770-01	7780-03	7780-04
		5	7784-07	7784-05	7784-05	7784-05	7784-01	7784-02
Luer Tip Syringes & Repl. Needles	Luer Tip (LT) Syringe (needle sold separately)	80001	80201	80901	81001	81101	81201	
	Replacement Needles (sold separately)	Point Style	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub	
		2	90139	90138	90138	90138	90138	90122
		3	90539	90534	90534	90534	90534	90134
		5	7746-12	7746-11	7746-11	7746-11	7746-11	7746-06
SL Syringes & Repl. Needles	SampleLock (SL) Syringe (point style 2)	N/A	N/A	80956	81056	81156	81256	
	Replacement Needles (sold separately)	Point Style			Large RN	Large RN	Large RN	
		2			7779-03	7779-03	7779-03	7779-01
		3			7780-03	7780-03	7780-03	7780-04
		5			7784-01	7784-01	7784-01	7784-02
PTFE Luer Lock Syringes & Repl. Needles	PTFE Luer Lock (TLL) Syringe (needle sold separately)	N/A	N/A	80920	81020	81120	81220	
	Replacement Needles (sold separately)	Point Style	Metal Hub	Metal Hub	Metal Hub	Metal Hub	Metal Hub	
		2	90039	90038	90038	90038	90038	90022
		3	91039	91038	91038	91038	91038	91022
		5	7729-01	7729-02	7729-02	7729-02	7729-02	7729-07
			Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub
		2	90139	90138	90138	90138	90138	90122
		3	90539	90534	90534	90534	90534	90134
		5	7746-12	7746-11	7746-11	7746-11	7746-06	
ChemSeal (C) (no needle available)	80062	80262	80962	81062	81162	81262		
ACCESSORIES (Syringe not included)								
	PB600 Repeating Dispenser	83700	83700	83700	83700	83700	83700	
	Reproducibility (Chaney) Adapter	14700	14725	14725	14725	14725	14725	
	Syringe Guide	14806	14906	14906	14906	14906	14906	
	Digital Base Unit	Add "DS" to the beginning of the syringe's part number. (Base unit not sold separately)						

1) LTN gauge 2) 22s gauge 3) 22 gauge

For Syringe Calibration Service, add the prefix "CAL" to the beginning of the syringe's part number.

Note: Max temp: Cemented Needle: 122 °F (50 °C), All others: 239 °F (115 °C) Max Pressure: 250 – 500 µL: 500 PSI, SampleLock Syringes: 250 PSI, All others: 1,000 PSI

Hamilton Gastight Syringes | 1000 Series



HAMILTON 1000 SERIES		VOLUME	1 mL	2.5 mL	5 mL	10 mL	25 mL	50 mL	100 mL
		MODEL	1001	1002	1005	1010	1025	1050	1100
		GAUGE	22	22	22	22	22	22	22
		LENGTH	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm
Cemented Needle Syringes		Cemented Needle (LTN) Syringe (point style 2)	81317	81417	81517	81617			
		Cemented Needle (LTN) Syringe (point style 3)	81316	81416	81516	81616			
		Cemented Needle (LTN) Syringe (specify needle)	81314	81414	81514	81614			
Removable Needle Syringes & Repl. Needles		Removable Needle (RN) Syringe (point style 2)	81330 81365 ¹	81430	81530	81630			
		Removable Needle (RN) Syringe (needle sold separately)	7649-01	7650-01	7651-01	7652-01			
		Replacement Needles (sold separately)	Point Style	Large RN	Large RN	Large RN	Large RN		
			2	7779-01	7779-01	7779-01	7779-01		
			3	7780-04	7780-04	7780-04	7780-04		
			5	7784-02	7784-02	7784-02	7784-02		
Luer Tip Syringes & Repl. Needles		Luer Tip (LT) Syringe (needle sold separately)	81301	81401	81501	81601			
		Replacement Needles (sold separately)	Point Style	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub		
			2	90122	90122	90122	90122		
			3	90134	90134	90134	90134		
			5	7746-06	7746-06	7746-06	7746-06		
SL Syringes & Repl. Needles		SampleLock (SL) Syringe (point style 2)	81356	81456	81556	81656	86326	86336	86346
		Replacement Needles (sold separately)	Point Style	Large RN	Large RN	Large RN	Large RN	Large RN	Large RN
			2	7779-01	7779-01	7779-01	7779-01	7779-01	7779-01
			3	7780-04	7780-04	7780-04	7780-04	7780-04	7780-04
			5	7784-02	7784-02	7784-02	7784-02	7784-02	
PTFE Luer Lock Syringes & Repl. Needles		PTFE Luer Lock (TLL) Syringe without slots (needle sold separately)	81320	81420	81520	81620	82520	85020	86020
		PTFE Luer Lock (TLL) Syringe without flange, without slots (needle sold separately)	—	—	—	—	82521	85021	—
		Replacement Needles (sold separately)	Point Style	Metal Hub	Metal Hub	Metal Hub	Metal Hub	Metal Hub	Metal Hub
			2	90022	90022	90022	90022	90022	90022
			3	91022	91022	91022	91022	91022	91022
			5	7729-07	7729-07	7729-07	7729-07	7729-07	7729-07
			Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub	Kel-F Hub	
		2	90122	90122	90122	90122	90122	90122	
		3	90134	90134	90134	90134	90134	90134	
		5	7746-06	7746-06	7746-06	7746-06	7746-06	7746-06	
	ChemSeal (C) (no needle available)	81360	81460	81560	81660	—	—	—	
ACCESSORIES (Syringe not included)									
	PB600 Repeating Dispenser	83700	83700	—	—	—	—	—	—

1) Needle is point style 3

For Syringe Calibration Service, add the prefix "CAL" to the beginning of the syringe's part number.

Note: Max temperature: Cemented Needle: 122 °F (50 °C), All others: 239 °F (115 °C) Max pressure: 1 – 10 mL: 200 PSI, All others: 100 PSI





SYRINGES Hamilton Manual Syringes

Hamilton Gastight Syringes | 1800 Series



The 1800 series syringe is the Gastight version of the 800 series syringes. The 1800 series was designed to eliminate the possibility of plunger damage. It has the same liquid handling capabilities as the 1700 series but the extended plunger eliminates breakage and allows the user some control over the dispense speed.

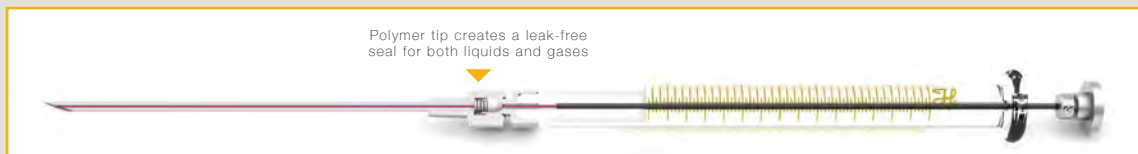
HAMILTON 1800 SERIES

		VOLUME	10 μ L	25 μ L	50 μ L	100 μ L	250 μ L
 22 22s "s" indicates thicker wall for added strength		MODEL	1801	1802	1805	1810	1825
		GAUGE	26s	22s	22s	22s	22s
Removable Needle Syringes & Repl. Needles	 Removable Needle (RN) Syringe (point style 2)		84877	84880	84883	84886	84889
	 Removable Needle (RN) Syringe (needle sold separately)		7659-01	7660-01	7661-01	7662-01	7663-01
	 Replacement Needles (sold separately)	Point Style 2 3 5	Small RN 7758-02 7768-01 7784-07	Small RN 7758-03 7770-01 7784-05	Small RN 7758-03 7770-01 7784-05	Small RN 7758-03 7770-01 7784-05	Large RN 7779-03 7780-03 7784-01
ACCESSORIES (Syringe not included)							
		Reproducibility (Chaney) Adapter	32146	32146	32146	32146	32146

For Syringe Calibration Service, add the prefix "CAL" to the beginning of the syringe's part number.

Note: Needles are 51 mm; Max temperature: Cemented Needle: 122° F (50 ° C) Removable Needle: 239° F (115° C); Max pressure: 1,000 PSI, except 250 μ L: 500 PSI


Gastight Syringes



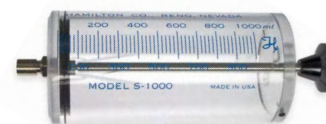
Hamilton Gastight Syringes | Super Syringe

Super Syringes were designed primarily for air sampling, preparing gas standards, calibrating reservoirs, and pneumographs. The Super Syringe is the only Hamilton syringe with an acrylic barrel, which makes this syringe slightly less chemically resistant.

HAMILTON SUPER SYRINGE

		VOLUME	0.5 L	1 L	1.5 L	2 L
MODEL			S0500	S1000	S1500	S2000
 PTFE Luer Lock (TLL) Syringe		86311	86312	86313	86314	
		Tracheal Adapter	86301	86302		

Note: Max temperature: 80° C (176° F); Max pressure: 30 PSI



Hamilton Replacement Needles (6/pk)

HAMILTON HUB NEEDLES

METAL HUB (N)						KEL-F HUB (KF)				
GAUGE	PT STYLE 2	PT STYLE 3	PT STYLE 5	CUSTOM NEEDLES ¹ PT STYLES 2, 3, 4	CUSTOM NEEDLES ² PT STYLES 5, AS	PT STYLE 2	PT STYLE 3	PT STYLE 5	CUSTOM NEEDLES ¹ PT STYLES 2, 3, 4	CUSTOM NEEDLES ² PT STYLES 5, AS
33	90033	91033	—	7747-01	—	—	—	—	—	—
32	90032	91032	—	7747-02	—	—	—	—	—	—
31	90031	91031	—	7748-17	—	90131	90531	—	7750-22	—
30	90030	91030	—	7748-16	—	90130	90530	—	7750-21	—
29	90029	91029	—	7748-15	—	90129	90529	—	7750-20	—
28	90028	91028	—	7748-14	—	90128	90528	—	7750-19	—
27	90027	91027	—	7748-13	—	90127	90532	—	7750-18	—
26s	90039	91039	7729-01	7748-19	7751-19	90139	90539	7746-12	7750-24	7752-19
26	90026	91026	7729-03	7748-12	7751-17	90126	90533	7746-10	7750-17	7752-17
25	90025	91025	7729-04	7748-11	7751-16	90125	90525	7746-09	7750-16	7752-16
24	90024	91024	7729-05	7748-10	7751-15	90124	90524	7746-08	7750-15	7752-15
23	90023	91023	7729-06	7748-09	7751-14	90123	90523	7746-07	7750-14	7752-14
22s	90038	91038	7729-02	7748-18	7751-18	90138	90534	7746-11	7750-23	7752-18
22	90022	91022	7729-07	7748-08	7751-13	90122	90134	7746-06	7750-13	7752-13
21	90021	91021	7729-08	7748-07	7751-12	90121	90521	7746-05	7750-12	7752-12
20	90020	91020	7729-09	7748-06	7751-11	90120	90520	7746-04	7750-11	7752-11
19	90019	91019	7729-14	7748-05	7751-10	90119	90519	7746-13	7750-10	7752-10
18	90018	91018	7729-10	7748-04	7751-09	90118	90535	7746-03	7750-09	7752-09
17	90017	91017	7729-11	7748-03	7751-08	90117	90517	7746-02	7750-08	7752-08
16	90016	91016	7729-12	7748-02	7751-07	90116	90516	7746-01	7750-07	7752-07
15	90015	91015	7729-13	7748-01	7751-06	90115	90515	7746-14	7750-06	7752-06
14	90014	91014	7730-01	7749-05	7751-05	90114	90514	7746-15	7750-05	7752-05
13	90013	91013	7730-02	7749-04	7751-04	90113	90513	—	7750-04	7752-04
12	90012	91012	7730-03	7749-03	7751-03	90112	90512	—	7750-03	7752-03
11	90011	91011	7730-04	7749-02	7751-02	90111	90511	—	7750-02	7752-02
10	90010	91010	7730-05	7749-01	7751-01	90110	90536	7746-16	7750-01	7752-01

HAMILTON REMOVABLE NEEDLES (RN)

FOR 2.5 – 100 µL SYRINGES						FOR 250 µL – 10 mL SYRINGES				
GAUGE	PT STYLE 2	PT STYLE 3	PT STYLE 5	CUSTOM NEEDLES ¹ PT STYLES 2, 3, 4	CUSTOM NEEDLES ² PT STYLES 5, AS	PT STYLE 2	PT STYLE 3	PT STYLE 5	CUSTOM NEEDLES ¹ PT STYLES 2, 3, 4	CUSTOM NEEDLES ² PT STYLES 5, AS
33	—	7762-06	—	7803-05	—	—	—	—	—	—
32	—	7762-05	—	7803-04	—	—	—	—	—	—
31	—	7762-04	—	7803-03	—	—	—	—	—	—
30	—	7762-03	—	7803-07	—	—	—	—	—	—
28	—	7762-02	—	7803-02	—	—	—	—	—	—
27	—	7762-01	—	7803-01	—	—	—	—	—	—
26s	7758-02	7768-01	7784-07	7804-04	7731-02	7779-02	7780-01	7784-03	7806-04	7732-04
26	7758-04	7768-02	7784-08	7804-03	7731-01	7779-04	7780-02	7784-04	7806-03	7732-03
22s	7758-03	7770-01	7784-05	7804-02	7731-04	7779-03	7780-03	7784-01	7806-02	7732-02
22	7758-01	7770-02	7784-06	7804-01	7731-03	7779-01	7780-04	7784-02	7806-01	7732-01

1) Please specify length and point style

2) Please specify length (Point style 5)

Authorized
Distributor

HAMILTON

800.822.5242 | 952.431.6000 | www.chromtech.com

Hamilton Syringe Accessories

PB600 Repeating Dispenser

Consistently dispense sample up to 50 times with the push of a button. The repeating dispenser works with Microliter or Gastight syringes from 10 μ L to 10 mL.



USE THIS SYRINGE VOLUME	μ L PER DISPENSE
10 μ L	0.2 μ L
25 μ L	0.5 μ L
50 μ L	1 μ L
100 μ L	2 μ L
250 μ L	5 μ L
500 μ L	10 μ L
1 mL	20 μ L
2.5 mL	50 μ L
5 mL	100 μ L
10 mL	200 μ L

Digital Syringe™

The only N.I.S.T. traceable, calibrated syringe device available. It comes completely calibrated with its own "Certificate of Calibration". The easy-to-read LCD screen displays volume dispensed within $\pm 0.5\%$ of the syringe volume. It is used with Hamilton syringes with total volumes of 0.5 to 500 μ L.



Reproducibility (Chaney) Adapter

For consistent, reproducible injections. It also prevents the plunger from bending. The adjustable stop prevents plunger damage. Easily installed.



Syringe Guide

The Syringe Guide is a cost effective plunger support device. With only two guide arms the Syringe Guide protects the plunger from damage but should not be used to improve accuracy and precision.



Calibrated Syringe

Hamilton Company offers a calibration service for precision syringes and Digital Syringes. A Certificate of Calibration is provided with the product and the procedure is performed with an unbroken chain of calibrations traceable to N.I.S.T. procedure



MTB Sampling Valve

- ➔ Lever-actuated on/off valve for storing and transporting samples in any Gastight TLL syringe
- ➔ Kel-F hub needles attach to the valve
- ➔ Pressure tested to 100 PSI; autoclavable
- ➔ Bore I.D., 0.039"



PART NO	DESCRIPTION
86580	MTB Sampling Valve

Septum Adapter

- ➔ Store and sample syringe contents through the Septum Adapter
- ➔ Attaches to any TLL syringe or luer lock fitting
- ➔ Replaceable septum



PART NO	DESCRIPTION
31335	Septum Adapter (TLL), includes 12 septa
75810	Replacement Septa, 7 mm dia, 12/pk

Removable (RN) Adapters

- ➔ For 250 μ L and larger removable needle (RN) syringes
- ➔ Port ID of .039" allows sample spiking with a 701N syringe
- ➔ Provides connection to threaded fittings, tubing assemblies, tees and crosses

PART NO	DESCRIPTION
35080	Male Luer/Removable Needle Hub (L)
35081	Female Luer/Removable Needle Hub (L)
35083	Male Luer Lock/Removable Needle Hub (L)



Hamilton Syringe Cleaning & Maintenance

Syringe Cleaner

- ➔ Clean 7000 Series Modified Microliter syringes with only heat (370 °C) or add a vacuum source (0.1 mm mercury) to remove suspected residuals
- ➔ Microliter and Gastight syringes may be cleaned when a voltage rheostat* is added to reduce the chamber temperature to 50 °C; a vacuum source (0.1 mm mercury) can be added to remove suspected residuals
- ➔ Not effective for frozen plungers or plugged needles



PART NO	DESCRIPTION
76610	Syringe Cleaner, 120VAC
76615	Syringe Cleaner, 220VAC
76022	Replacement Septa, 5 mm diameter, 12/pk

* Note: Voltage rheostat and vacuum source must be purchased separately

Syringe Cleaning Tips

To clean the plunger, remove it from the syringe barrel and gently wipe with a lint-free tissue. Reinsert the plunger into the barrel and pump deionized water or acetone through the needle and syringe. Air dry the syringe for storage.

Needle Cleaning Kit

- ➔ Contains a selection of various diameter tungsten wires for cleaning plugged needles
- ➔ Biodegradable cleaning concentrate helps to remove tenacious residues

PART NO	DESCRIPTION
18311	Cleaning Concentrate, 500 mL (not included in cleaning kit)



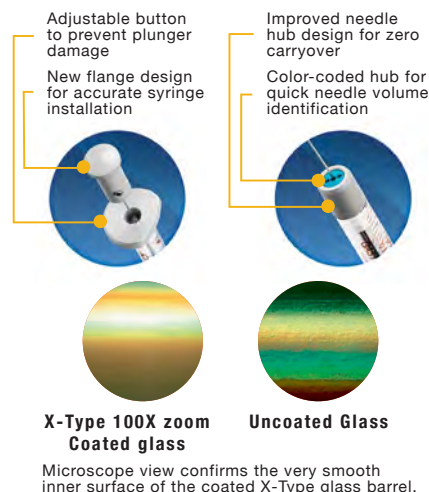
HAMILTON CLEANING WIRES		
PART NO	CLEANING WIRES (7" IN LENGTH)	USE TO CLEAN NEEDLE GAUGES
18306	.00300" O.D., 10/pk	23s, 26s, 31-33
18300	.00350" O.D., 10/pk	26s, 31-33
18301	.00497" O.D., 10/pk	22s, 25s, 28-30
18302	.00659" O.D., 10/pk	27
18303	.00815" O.D., 10/pk	24-26
18304	.01207" O.D., 10/pk	22, 23 (and larger)

Needle Cleaning Tips

Should a needle become clogged, do not attempt to clean it by forcing liquid or compressed air through the syringe. Excessive pressure will split the glass barrel. Remove the plunger from the syringe before cleaning the needle. Cleaning wires are used to dislodge any foreign material or residue build-up. Use deionized water or acetone to thoroughly rinse the syringe.

Hamilton CTC LC Autosampler Syringes

FEATURES	ADVANTAGES/BENEFIT	S LINE	C LINE	X TYPE
Inert PTFE-Polymer Plunger Tip	High mechanical stability for increased syringe lifetime.	X	X	X
Inert PTFE-Polymer Plunger Tip	Compatible with organics, and high as well as low pH solutions.	X	X	X
Unique plunger and flange design	Ensures reliable installation and alignment of the plunger and barrel		X	X
Needle attached directly to the barrel	Minimizes carryover		X	X
No glue or cement in fluid path	Better solvent compatibility — longer syringe life		X	X
Deactivated needle and barrel	Prevents sample adsorption on inner surface of the barrel			X
Deactivated needle and barrel	Extremely smooth surface for low friction and increased plunger lifetime			X
Deactivated needle and barrel	Eliminates contact between samples and metal components			X



HAMILTON SYRINGES FOR CTC/LEAP LC AUTOSAMPLERS

VOLUME	TYPE	10 µL	25 µL	50 µL	100 µL	100 µL	250 µL	500 µL	1000 µL	2500 µL	5000 µL
HAMILTON CTC PAL HTC-xt, HTS-xt AND HTX-xt LC AUTOSAMPLER SYRINGES											
MODEL	*s" indicates thicker wall for added strength	1701	1702	1705	1710	1710	1725	1750	1001	1002	1005
GAUGE	22 22s	22s	22s	22	22	22s	22	22	22	22	22
Cemented (N) Needle (point style 3)	S	67444-01 ²	67446-01	67450-01 ²	—	67452-01 ²	67442-01	67448-01	—	—	—
Fixed Needle (FN) (point style 3)	C	203194 ²	203075	—	203235 ²	203077 ²	203079	203349	203081 ¹	203083 ¹	203085 ¹
Fixed Needle (FN) (point style 3)	X	—	204475	—	204400 ²	204452 ²	—	—	—	—	—
HAMILTON CTC LEAP A200S LC AUTOSAMPLER SYRINGES											
Cemented (N) Needle (point style 3)	S	203560 ²	—	—	—	203566 ²	—	—	—	—	—

Note: Needles are 51 mm ¹LTN Termination ²Slimline Syringe

TECH TIP | Related Product

Inlet Needle Sleeves

Designed to fit CTC PAL Autosamplers



PART NO	DESCRIPTION	QTY
CT-22NS	Inlet Needle Sleeve	5/pk
CT-22NS-50	Inlet Needle Sleeve	50/pk

HAMILTON AUTOSAMPLER SYRINGES






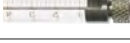





VOLUME	25 µL	50 µL	100 µL	250 µL	500 µL	1000 µL	2500 µL	5000 µL
MODEL	1702	1705	1710	1725	1750	1001	1002	1005
GAUGE	No needle	No needle	No needle	No needle	No needle	No needle	No needle	No needle
FOR THERMO SCIENTIFIC® AS 100/300 & AS 1000/3000/3500								
ChemSeal (C) Syringe	—	—	—	202145	81260	81360	81460	81560
FOR SPARK HOLLAND*								
ChemSeal (C) Syringe	62161-01	—	54658-01	54659-01	54660-01	54661-01	54662-01	—
FOR PERKINELMER SERIES 200								
ChemSeal (C) Syringe	—	80962	—	81162	81262	81360	81460	—

The Hamilton Spark Holland syringe line works with the following manufacturers' autosamplers: Spark Holland Midas, Triathlon, Endurance and Alias, Antec AS 100 and AS 110, Dionex ESA Model 542, 540 and 540MT, Beckman Coulter 508, and Grace/Alltech Model 580.

Hamilton Syringes for Most Manual HPLC Valves

- ➔ Point style 3, 22 or 22s gauge needle
- ➔ For IDEX valves (Rheodyne & Upchurch), Valco®, Beckman Coulter, Altex and SSI Injection Valve Syringes



HAMILTON 700 SERIES MANUAL SYRINGES										
		VOLUME	10 µL	25 µL	50 µL	100 µL	250 µL	500 µL		
		*s* indicates thicker wall for added strength	MODEL	701	702	705	710	725	750	
22	22s		GAUGE	22s	22s	22s	22s	22	22	
			Cemented Needle (N) Syringe	80365	80465	80565	80665	80765	80865	
HAMILTON 1700 SERIES MANUAL SYRINGES										
		VOLUME	10 µL	25 µL	50 µL	100 µL	250 µL	500 µL		
			MODEL	1701	1702	1705	1710	1725	1750	
			GAUGE	22s	22s	22s	22s	22s	22	
			Cemented Needle (N) Syringe	N/A	80275	80975	81075	81175 ²	81216 ²	
			Removable Needle (RN) Syringe	80065	80265	80965	81065	81165 ¹	81265	
			Removable Needle (RN) Syringe (needle sold separately)	7653-01	7654-01	7655-01	7656-01	7657-01	7658-01	
			Replacement Needles (sold separately)	Point Style 3	Small RN 7770-01	Small RN 7770-01	Small RN 7770-01	Small RN 7770-01	Large RN 7780-03	Large RN 7780-04
			Luer Tip (LT) Syringe (needle sold separately)		80001	80201	80901	81001	81101	81201
			PTFE Luer Lock (TLL) Syringe (needle sold separately)		N/A	N/A	80920	81020	81120	81220
			Replacement Needles (sold separately)	Point Style 3	Metal Hub 91038	Metal Hub 91038	Metal Hub 91038	Metal Hub 91038	Metal Hub 91038	Metal Hub 91022
			Replacement Needles (sold separately)	Point Style 3	Kel-F Hub 90534	Kel-F Hub 90534	Kel-F Hub 90534	Kel-F Hub 90534	Kel-F Hub 90534	Kel-F Hub 90134





For Syringe Calibration Service, add the prefix "CAL" to the beginning of the syringe's part number.

Note: Needles are 51 mm

1) 22 gauge

2) LTN Termination

Hamilton Syringes for Valco® VISF-1 Valves

HAMILTON SYRINGES FOR VALCO® VISF-1 INJECTION VALVE										
		VOLUME	25 µL	50 µL	100 µL	250 µL	5000 µL	10000 µL		
		*s* indicates thicker wall for added strength	MODEL	1702	1705	1710	1725	1750	1001	
22	22s		GAUGE	22s	22s	22s	22s	22	22	
			Removable Needle (RN) Syringe (point style 3)	80231	80931	81031	81131	81231	81331	
			Replacement Needles 6/pk (sold separately)	Point Style 3	7787-01	7787-01	7787-01	7806-02*	7787-02	7787-02





*Please specify length and point style

Note: Needles are 19 mm



Hamilton Syringes for Agilent GC Instrumentation

			HP 7693/7683/HP 7673						HP 7670,7671, 7672	
			ASN AUTOSAMPLER CEMENTED NEEDLE			ASRN AUTOSAMPLER REMOVABLE NEEDLE			(N) CEMENTED NEEDLE	(RN) REMOVABLE NEEDLE
MODEL	VOLUME	GAUGE/LENGTH/PT STYLE	23s	26s	23-26s	23s	26s	23-26s	26s	26s
MICROLITER™ SYRINGES										
7000.5	.5µL	x/1.71"/HP	—	—	—	86276	86274	—	—	—
7001	1µL	x/1.71"/HP	—	—	—	80176	80175	—	—	—
75	5µL	x/1.71"/HP	87987	87988	87993	87957	87958	87959	—	—
75, 6/pk	5µL	x/1.71"/HP	87990	87989	87994	—	—	—	—	—
75	5µL	x/2"/2	87991	87992	—	—	—	—	87900	—
701	10µL	x/1.71"/HP	80387	80388	80393	80357	80358	80359	—	—
701, 6/pk	10µL	x/1.71"/HP	80390	80389	80391	—	—	—	—	—
701	10µL	x/1.71/2	80398	80399	—	—	—	—	—	—
701	10µL	x/2"/2	—	—	—	—	—	—	80300	80338
701, 6/pk	10µL	x/2"/2	—	—	—	—	—	—	80366	—
GASTIGHT® SYRINGES										
175	5µL	x/1.71"/HP	—	—	80076	—	—	80086	—	—
175, 6/pk	5µL	x/1.71"/HP	80090	—	80092	—	—	—	—	—
1701	10µL	x/1.71"/HP	80080	—	80079	80087	80088	80089	—	—
1701, 6/pk	10µL	x/1.71"/HP	80094	—	80096	—	—	—	—	—
1701	10µL	x/2"/2	—	—	—	—	—	—	80000	80011







Hamilton Syringes for Thermo Scientific® Autosampler Syringes

HAMILTON SYRINGES FOR THERMO SCIENTIFIC AS 800, AS 2000			
		VOLUME	10 µL
		*s* indicates thicker wall for added strength	MODEL
			701
			GAUGE
			26s
		Cemented Needle (N) Syringe (point style AS)	80318

Note: Needles are 80 mm

HAMILTON SYRINGES FOR THERMO SCIENTIFIC HEADSPACE HS 250/500/850			
		VOLUME	2500 µL
			MODEL
			1002
			GAUGE
			22
		Cemented Needle (LTN) Syringe (point style 5)	202660

Note: Needles are 56 mm




HAMILTON SYRINGES FOR THERMO SCIENTIFIC AI/AS 3000 TRI PLUS SYRINGES				
		VOLUME	5 µL	10 µL
		*s* indicates thicker wall for added strength	MODEL	75
			GAUGE	26s
				26s
		Cemented Needle (N) Syringe (point style AS)	204051	204052
		Cemented Needle (N) Syringe (point style 2)	204000	204001

Note: Needles are 50 mm






Thermo Scientific® Finnigan AS 2000 Autosampler

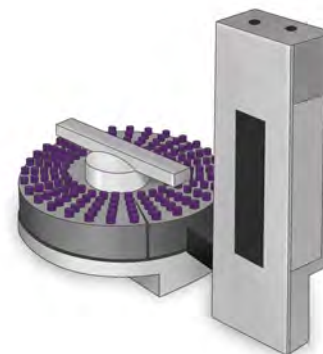
Hamilton Syringes for Shimadzu Autosampler

HAMILTON SYRINGES FOR SHIMADZU AOC-9			VOLUME	5 µL	10 µL
		*s* indicates thicker wall for added strength	MODEL	75	701
			GAUGE	26s	26s
			Removable Needle (RN) Syringe (point style 2)	87930	80330

Note: Needles are 51 mm

HAMILTON SYRINGES FOR SHIMADZU AOC-14/AOC-17/AOC-20			VOLUME	5 µL	10 µL
		*s* indicates thicker wall for added strength	MODEL	75	701
			GAUGE	22s	22s
			Removable Needle (RN) Syringe (point style 2)	202630	202640



Note: Needles are 43 mm



Shimadzu AOC-14 Autosampler

Hamilton CTC GC Autosampler Syringes

FEATURES	ADVANTAGES/BENEFIT	S LINE	C LINE
Inert PTFE-Polymer Plunger Tip	High mechanical stability for increased syringe lifetime.	X	X
Inert PTFE-Polymer Plunger Tip	Compatible with organics, and high as well as low pH solutions.	X	X
Unique plunger and flange design	Ensures reliable installation and alignment of the plunger and barrel		X
Needle attached directly to the barrel	Minimizes carryover		X
No glue or cement in fluid path	Better solvent compatibility — longer syringe life		X

HAMILTON SYRINGES FOR CTC/LEAP GC AUTOSAMPLERS											
VOLUME	TYPE	5 µL	10 µL	10 µL	10 µL	25 µL	25 µL	25 µL	100 µL	100 µL	
HAMILTON CTC PAL GC-xt AND Combi PAL-xt GC AUTOSAMPLER SYRINGES											
MODEL	 	*s* indicates thicker wall for added strength	75	701	701	1701	1702	1702	1702	1710	1710
GAUGE	22 22s		26s	26s	23s	23s	23s	26s	26s	23	26s
Cemented (N) Needle (point style AS)	S		67436-01 ²	67438-01 ²	67440-01 ²	67454-01 ²	67430-01	—	—	67434-01 ²	—
Fixed Needle (FN) (point style AS)	C		203189 ²	203205 ² 203072 ^{1,2}	203361 ² 203363 ^{1,2}	—	—	203074 ²	203043	—	203076 ²

Note: Needles are 51 mm ¹PT Style 2 ²Slimline Syringe

HAMILTON SYRINGES FOR CTC/LEAP GC HEADSPACE AUTOSAMPLERS						
VOLUME	TYPE	1.0 mL	1.0 mL	2.5 mL	2.5 mL	5.0 mL
HAMILTON CTC PAL GC-xt AND Combi PAL-xt GC AUTOSAMPLER SYRINGES						
MODEL		1001	1001	1002	1002	1005
GAUGE		23	26	23	26	23
Luer Tip Cemented (LTN) Needle (point style 5)	HD	203082	203141	203084	203181	203086

Note: Needles are 51 mm

Hamilton SoftGrip Pipettes | Single Channel

- ➔ Wide selection of ergonomic pipettes
- ➔ Completely autoclavable
- ➔ Guaranteed accuracy and precision

SoftGrip pipettes routinely receive the highest user satisfaction score of 10 on 11 different aspects of a pipette, including plunger and eject forces, weight, diameter, and texture. Choose from six adjustable volume and ten fixed volume SoftGrip pipettes covering 0.2 μ L to 1 mL. All pipettes have color-coded plunger buttons and labels for easy volume identification.

SoftGrip air-displacement pipettes are built from high quality, state-of-the-art materials designed to provide years of reliable service. All pipettes are completely autoclavable for easy decontamination and sterilization without the need for disassembly and recalibration.

The isolated volume ring prevents accidental volume changes. A magnified, easy-to-read micrometer ensures reproducible, accurate volume setting. Each pipette meets or exceeds industry standards for accuracy and precision when used with Hamilton Universal AdvanTip Precision Pipette Tips.



HAMILTON SOFTGRIP ADJUSTABLE VOLUME PIPETTES, 0.2 μ L–1 mL				AT 10% OF PIPETTE VOLUME		AT 100% OF PIPETTE VOLUME	
PART NO	VOLUME	INCREMENTS (μ L)	COLOR	ACCURACY WITHIN \pm %	PRECISION WITHIN %	ACCURACY WITHIN \pm %	PRECISION WITHIN %
55019-30	0.2–2 μ L	0.002	Aqua	8.00	4.00	1.20	0.60
55019-32	1–10 μ L	0.02	Purple	2.50	1.20	0.80	0.40
55019-34	2.5–25 μ L	0.02	Forest Green	4.50	1.50	0.80	0.20
55019-36	10–100 μ L	0.2	Violet	1.80	0.70	0.60	0.15
55019-38	30–300 μ L	0.2	Brick Red	1.20	0.40	0.40	0.15
55019-40	100 μ L–1 mL	2.0	Sky Blue	1.60	0.50	0.30	0.12

HAMILTON SOFTGRIP FIXED VOLUME PIPETTES, 5 μ L–1 mL			AT 100% OF PIPETTE VOLUME	
PART NO	VOLUME	COLOR	ACCURACY WITHIN \pm %	PRECISION WITHIN %
55019-01	5 μ L	Steel Blue	1.40	0.75
55019-03	10 μ L	Purple	0.80	0.40
55019-05	25 μ L	Forest Green	0.80	0.30
55019-07	50 μ L	Sandstone	0.60	0.30
55019-09	100 μ L	Violet	0.50	0.20
55019-11	200 μ L	Mustard	0.40	0.18
55019-13	250 μ L	Burnt Orange	0.40	0.18
55019-15	300 μ L	Brick Red	0.40	0.18
55019-17	500 μ L	Olive Green	0.40	0.18
55019-19	1 mL	Sky Blue	0.30	0.12

HAMILTON SINGLE CHANNEL PIPETTE ACCESSORIES		
PART NO	PRODUCT	DESCRIPTION
53578-01	Single channel pipette carousel	Constructed of heavy, solvent-resistant plastic; holds six single and multi-channel pipettes
1987-01	Calibration labels, 120/pk	Quickly record and view calibration data with labels on your pipettes
34002	Calibration key	For simple calibration in the field

53578-01



1987-01



34002



Hamilton SoftGrip Pipettes | Multi-Channel

- ➔ Easily Adjusts for Left-Hand Operation
- ➔ Completely Autoclavable
- ➔ Guaranteed Accuracy and Precision

Hamilton SoftGrip pipettes are available as 8-channel and 12-channel adjustable volume manual pipettes in two volume ranges covering 5 µL to 50 µL and 30 µL to 300 µL. The pipettes have color-coded plunger buttons and labels for quick volume identification.

The unique, long tip ejector lever and movable lower body can be rotated a full 360° relative to the handle to provide maximum comfort for left- or right-handed use. Additionally, the easily activated tip ejector lever releases all the tips in single stroke.

Made of the finest materials, the entire SoftGrip multi-channel pipette can be autoclaved without the need for disassembly or recalibration.

Accuracy and precision is guaranteed when used with Hamilton Universal AdvanTip Precision Pipette Tips.



HAMILTON SOFTGRIP MULTI-CHANNEL PIPETTES, 8-CHANNEL, 5 µL–300 µL				AT 10% OF PIPETTE VOLUME		AT 100% OF PIPETTE VOLUME	
PART NO	VOLUME	INCREMENTS (µL)	COLOR	ACCURACY WITHIN ±%	PRECISION WITHIN %	ACCURACY WITHIN ±%	PRECISION WITHIN %
55019-50	5 – 50 µL x 8	0.02	● Sandstone	2.00	2.00	0.80	0.35
55019-52	30 – 300 µL x 8	0.2	● Brick Red	1.20	0.70	0.50	0.30

HAMILTON SOFTGRIP MULTI-CHANNEL PIPETTES, 12-CHANNEL, 5 µL–300 µL				AT 10% OF PIPETTE VOLUME		AT 100% OF PIPETTE VOLUME	
PART NO	VOLUME	INCREMENTS (µL)	COLOR	ACCURACY WITHIN ±%	PRECISION WITHIN %	ACCURACY WITHIN ±%	PRECISION WITHIN %
55019-54	5 – 50 µL x 12	0.02	● Sandstone	5.00	2.00	1.00	0.50
55019-52	30 – 300 µL x 12	0.2	● Brick Red	2.40	1.20	1.00	0.50

HAMILTON MULTI-CHANNEL PIPETTE ACCESSORIES		
PART NO	PRODUCT	DESCRIPTION
34195	Multi-Channel Pipette Stand	Constructed of heavy, solvent-resistant plastic; holds one multi-channel pipette
1987-01	Calibration labels, 120/pk	Quickly record and view calibration data with labels on your pipettes
34002	Calibration key	For simple calibration in the field



Hamilton Universal AdvanTip LT & Precision Pipette Tips

10 µL Pipette Tips

Volume Range 0.2 – 10 µL
Recommended for 2, 5, and 10 µL pipettes

HAMILTON 10 µL PIPETTE TIPS			
LOW RETENTION	STANDARD	DESCRIPTION	TOTAL TIPS
23008-10	—	Bulk, 1,000 tips/bag	1,000
23005-14	11005-14	Bulk, Extended Length, 1,000 tips/bag	1,000
68007-21	68007-11	Racked, 96 tips/rack	1,152
68007-24	—	Racked, Extended Length, 96 tips/rack	960
—	68007-12	Racked, Pre-Sterilized, 96 tips/rack	960
68007-23	68007-13	Racked, Filter, Pre-Sterilized, 96 tips/rack	1,152
68007-26	11003-26	Racked, Extended Length, Filter, Pre-Sterilized, 96 tips/rack	960
—	11003-11	Stacked Rack, 96 tips/rack, 5 racks/stack	480



200 µL Pipette Tips

Volume Range 2 – 200 µL
Recommended for 20, 25, 50, 100, and 200 µL pipettes. Also can be used with 300 µL pipettes when pipetting volumes of 200 µL or less

HAMILTON 200 µL PIPETTE TIPS			
LOW RETENTION	STANDARD	DESCRIPTION	TOTAL TIPS
68008-21	68008-11	Racked, 96 tips/rack	960
68008-22	68008-12	Racked, Pre-Sterilized, 96 tips/rack	960
68008-23	68008-13	Racked, Filter, Pre-Sterilized, 96 tips/rack	960



300 µL Pipette Tips

Volume Range 2 – 300 µL
Recommended for 250 and 300 µL pipettes

HAMILTON 300 µL PIPETTE TIPS			
LOW RETENTION	STANDARD	DESCRIPTION	TOTAL TIPS
68009-20	—	Bulk, 1,000 tips/bag	1,000
68009-21	68009-11	Racked, 96 tips/rack	960
68009-22	—	Racked, Pre-Sterilized, 96 tips/rack	960
68009-23	—	Racked, Filter, Pre-Sterilized, 96 tips/rack	960



1 mL Pipette Tips

Volume Range 100 – 1,000 µL
Recommended for 500 and 1,000 µL pipettes

HAMILTON 1 mL PIPETTE TIPS			
LOW RETENTION	STANDARD	DESCRIPTION	TOTAL TIPS
68010-20	—	Bulk, 1,000 tips/bag	1,000
68010-21	—	Racked, 96 tips/rack	576
68010-22	68010-12	Racked, Pre-Sterilized, 96 tips/rack	576
68010-23	68010-13	Racked, Filter, Pre-Sterilized, 96 tips/rack	576



Hamilton SofTop™ Quick Dispenser

- ➔ Adjustable volume bottle top dispensing
- ➔ Maximum chemical and thermal resistance with ceramic plunger
- ➔ Fast and accurate micrometer volume adjustment

The SofTop Quik Dispenser is safe and easy-to-use with an exceptional soft touch and sure-grip ergonomic design. Calibrated volumetric steps assure identical volume delivery every time. The graduated gauge offers user-independent reproducible volume delivery.

With an innovative plunger made of aluminum oxide ceramic, there is no chance of abrasions, scratching, swelling, or flaking of a coating layer. The SofTop Quik Dispenser has a screw-fitted suction hose, eliminating the possibility of air bubbles during aspiration.

The fully autoclavable SofTop Quik Dispenser is available in six versions from 0.2 mL to 60 mL. Each dispenser is individually tested and shipped with a Certificate of Quality.



HAMILTON SOFTOP™ QUICK DISPENSER

PART NO	DESCRIPTION
51249-01	SofTop Quik Dispenser, 0.2 – 1.0 mL
51249-20	SofTop Quik Dispenser, 0.4 – 2.0 mL
51249-10	SofTop Quik Dispenser, 2 – 10 mL
51249-30	SofTop Quik Dispenser, 5 – 30 mL
51249-60	SofTop Quik Dispenser, 10 – 60 mL
51249-70	Dispensing Nozzle for SofTop Quik Dispensers up to 10 mL
51249-72	Dispensing Nozzle for SofTop Quik Dispensers 30 mL and 60 mL
51249-74	Suction Tube for SofTop Quik Dispensers up to 10 mL, 12"
51249-76	Suction Tube for SofTop Quik Dispensers 30 mL and 60 mL, 12"

Benefits of the Hamilton Microlab 600

- ➔ Reduce time preparing samples or dispensing reagents
- ➔ Minimize experimental variation from one user to the next
- ➔ Manage log files from any PC
- ➔ Comply with EPA, FDA GLP and GMP, 21 CFR Part 11, and ISO
- ➔ N.I.S.T. traceable calibration

The Microlab 600 offers labs a way to securely monitor processes and greatly increase efficiency. No more adjusting pipettes and recalculating dilutions. Quickly recall stored dispenses and dilutions with Favorites. Trigger the hand probe or tap the foot switch to actuate the syringe drives according to a predefined program.



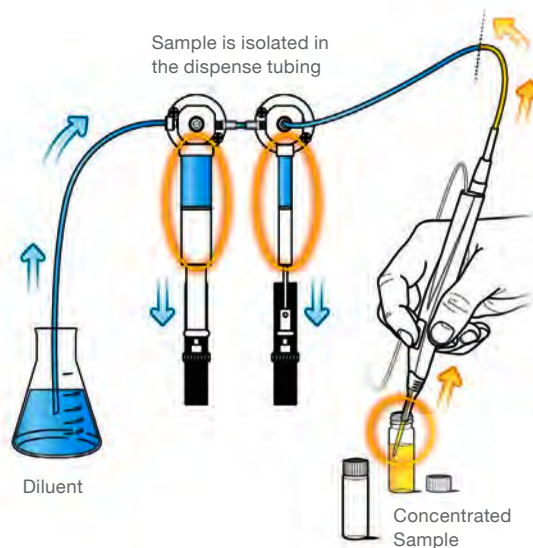
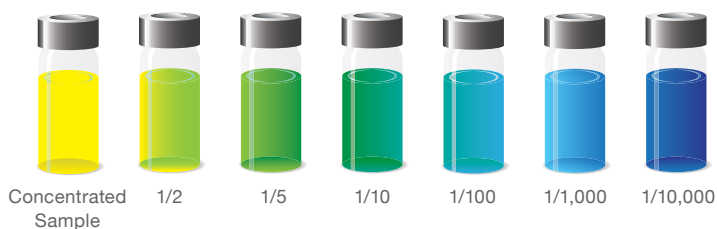
Hamilton Dual Syringe Diluters

How Does it Work?

Step 1. Program sample and diluent volume.

Step 2. Trigger the hand probe to fill left syringe with diluent and aspirate sample into the hand probe with the right syringe.

Step 3. Trigger the hand probe to dispense the sample and then the diluent into the vial to complete the dilution and wash the tube for the next sample.



HAMILTON DUAL SYRINGE DILUTERS

PART NO	DESCRIPTION
CONCORDE HAND PROBE	
ML615-DIL	Dual Syringe Diluter with Basic Controller
ML625-DIL	Dual Syringe Diluter with Advanced Controller
DISPOSABLE TIP HAND PROBE	
ML625-DTHP	Microlab 600 Diluter with Disposable Tip Hand Probe
CLICKSURE TIPS FOR DTHP	
235537	50 µL, non-sterile ClickSure Tips, 960 tips, racked
235543	50 µL, non-sterile ClickSure Tips, 960 tips, bulk
235536	50 µL, sterile ClickSure Tips, 960 tips, racked
235539	1 mL, non-sterile ClickSure Tips, 960 tips, racked
235545	1 mL, non-sterile ClickSure Tips, 960 tips, bulk
235538	1 mL, sterile ClickSure Tips, 960 tips, racked

CONCORDE HAND PROBE

ML615-DIL Dual Syringe Diluter with Basic Controller

ML625-DIL Dual Syringe Diluter with Advanced Controller

DISPOSABLE TIP HAND PROBE

ML625-DTHP Microlab 600 Diluter with Disposable Tip Hand Probe

CLICKSURE TIPS FOR DTHP

235537 50 µL, non-sterile ClickSure Tips, 960 tips, racked

235543 50 µL, non-sterile ClickSure Tips, 960 tips, bulk

235536 50 µL, sterile ClickSure Tips, 960 tips, racked

235539 1 mL, non-sterile ClickSure Tips, 960 tips, racked

235545 1 mL, non-sterile ClickSure Tips, 960 tips, bulk

235538 1 mL, sterile ClickSure Tips, 960 tips, racked

The -DIL model ships with the Concorde hand probe, universal valves, fill/dispense tubing, accessory holder, country-specific power cord, and the choice of two syringes. If syringes are not selected at the time of order, 2.5 mL and 250 µL syringes are included.

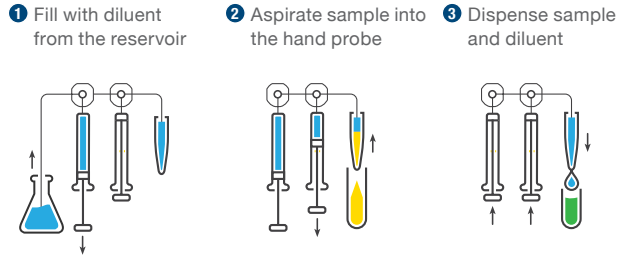
The -DTHP model ships with the Disposable Tip Hand Probe, universal valves, fill tubing, Cable Management System, country-specific power cord, and the choice of two syringes. If syringes are not selected at the time of the order, 2.5 mL and 250 µL syringes are included.



Hamilton Dual Syringe Diluters (cont.)

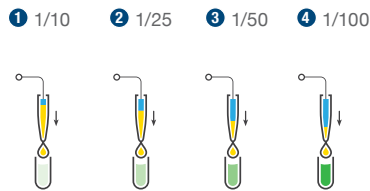
Dilution Wizard

Dual Syringe Dilution



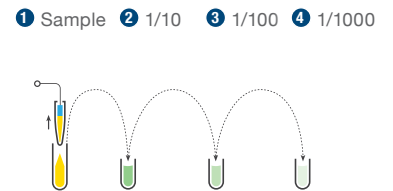
Serial Dilution (Programmed)

Repeat the steps for single or dual dilution with varying dilution ratios and the same final volume.

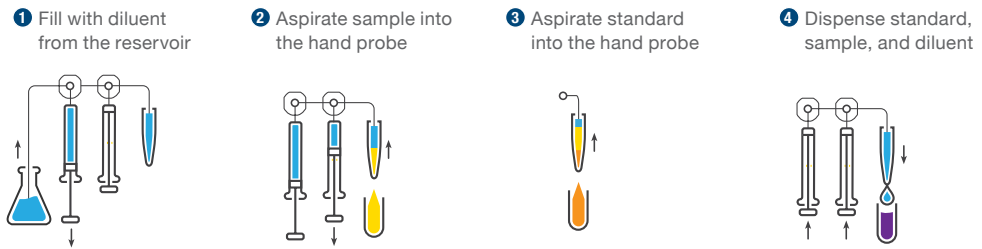


Serial Dilution (Tube to Tube)

Repeat the steps for single or dual dilution and use the resulting dilution as the sample for the next dilution.

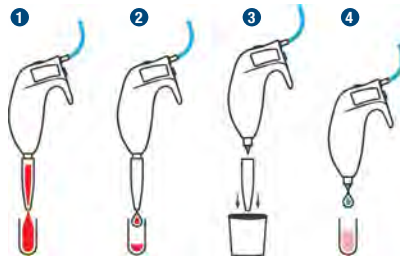


Multi Sample Dilution (or Internal Standard Addition)



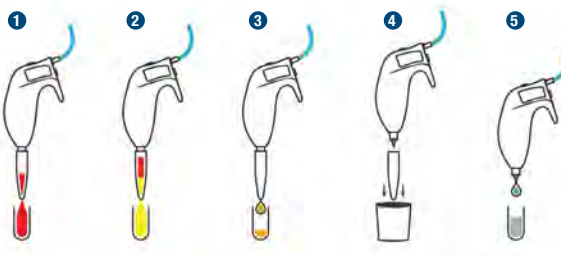
Dilution Options

Single Sample Dilution



- 1 The trigger is pressed and the sample is aspirated into the tip using the right syringe while diluent is drawn into the left syringe.
- 2 The trigger is pressed again and the sample is dispensed from the tip.
- 3 The tip is ejected.
- 4 Another trigger dispenses the diluent to complete the dilution.

Multi-Sample Dilution

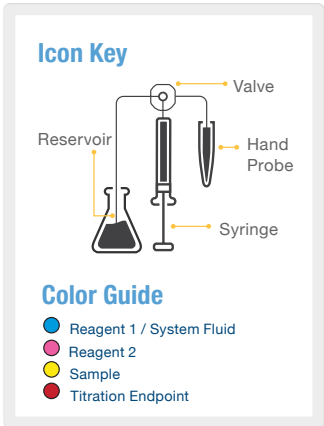


- 1 Aspirate Sample 1 into ClickSure Tip.
- 2 Aspirate Sample 2. Repeat with additional solutions.
- 3 Dispense Samples.
- 4 Discard ClickSure Tip.
- 5 Dispense Diluent.

Hamilton Dispensers

The Microlab 600 is able to dispense volumes from 100 nL to 50 mL. The Microlab 600 uses positive displacement syringes to accurately dispense volatile, viscous, and dense liquids independent of atmospheric influences. The inert fluid path is compatible with harsh chemicals, making the Microlab 600 the most reliable and robust dispensing system available.

HAMILTON DISPENSERS	
PART NO	DESCRIPTION
ML610-DIS	Single Syringe Dispenser with Basic Controller
ML620-DIS	Single Syringe Dispenser with Advanced Controller
ML615-DIS	Dual Syringe Dispenser with Basic Controller
ML625-DIS	Dual Syringe Dispenser with Advanced Controller
ML615-CNT	Dual Syringe Continuous Dispenser with Basic Controller
ML625-CNT	Dual Syringe Continuous Dispenser with Advanced Controller



Types of Dispensers

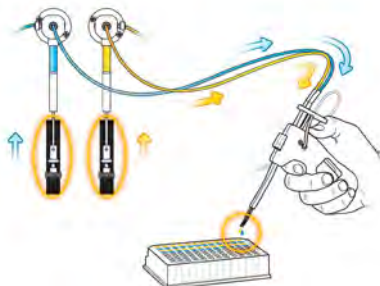
Single Syringe Dispenser

The syringe fills from a reservoir and dispenses from the hand probe.



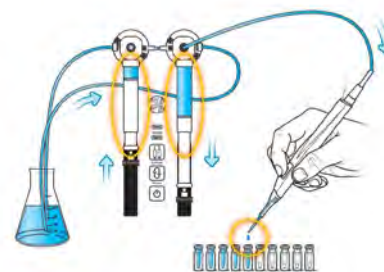
Dual Syringe Dispenser

Each syringe fills from a separate reservoir and dispenses separately from the hand probe.



Continuous Dispenser

One syringe fills while the other syringe is dispensing from the same reservoir.



Hamilton Dispensers (cont.)

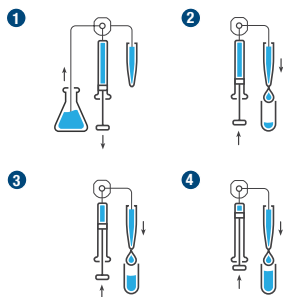
Dispenser Options

Aliquot Dispense Wizard

Repetitively dispense aliquots of the same volume at the press of a button.

Single Syringe Aliquot or Serial Dispense

- 1 Fill from reservoir
- 2 Dispense through hand probe
- 3 Dispense
- 4 Dispense

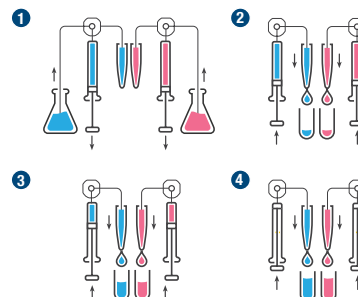


Serial Dispense Wizard

Repetitively dispense aliquots of differing volumes at the press of a button.

Dual Syringe Aliquot or Serial Dispense

- 1 Fill from reservoir
- 2 Dispense through hand probe
- 3 Dispense
- 4 Dispense



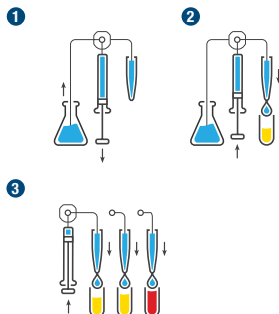
Titration Wizard

Slowly add liquid to another liquid until an end-point is reached. An example of this application is adding acid or base to a pH buffer.

Titration

A large initial volume is dispensed to get close to the endpoint. Then a smaller step volume is dispensed until the endpoint is reached.

- 1 Fill from reservoirs
- 2 Dispense the initial volume
- 3 Dispense the step volume

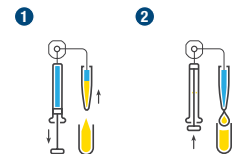


Pipette Wizard

Simulate a manual pipette used to transfer liquid from one vessel to the next.

Pipette

- 1 Aspirate sample into the hand probe
- 2 Dispense sample from the hand probe



Hamilton Microlab 600 Specifications

CONTROLLER SPECIFICATIONS

Screen size	5.7" (15 cm diagonal)
Screen resolution	640 x 480 pixels
Tilt positions	5 positions from 90° to flat
Mounting options	On top of the syringe pump, bench top, or wall mount
Program memory	2 GB (with Advanced upgrade)
Communication type	Ethernet, 10/100 BASE-T
Power rating	24 VDC, 2.5 A
Dimensions	2.29" x 6.5" x 7" (57.2 x 165.1 x 177.8 mm) in down position
Weight	1.9 lbs (0.86 kg)



- 1** Memory Slot
- 2** Optional Power Input
- 3** Host USB for Mouse, Keyboard, Printer, and Barcode Scanner
- 4** Ethernet
- 5** Slave USB Port
- 6** Optional RS-232

SINGLE AND DUAL SYRINGE PUMP SPECIFICATIONS

Accuracy	+/- 1%
Precision	+/- 0.2%
Syringe drive mechanism	1.8° stepper motor with variable volumetric flow rate
Flow rate	0.003–6000 µL/second (depending on the syringe that is selected)
Syringe resolution	0.002% of the nominal syringe volume
Compatible syringes	10, 25, 50, 100, 250, 500 µL, 1, 2.5, 5, 10, 25 and 50 mL BFP Syringes
Volume range	1.0 µL - 50 mL
Fluid path	Borosilicate, PTFE, CTFE
Communication type	Ethernet, 10/100 BASE-T
Communication protocol	.NET 2.0 Application Programming Interface (API)
Pump memory	One method stored in non volatile memory
Calibration	Factory tested and traceable to N.I.S.T. standards
Certifications	CE, CSA
Power requirements	100 - 240 V 1.5 A max 50160 Hz
Power rating	24 VDC, 2.5 A
Dimensions	7 x 5.5 x 10.5 inch (177.8 x 139.7 x 266.7 mm)
Weight	13 lbs (5.9 kg)



- 1** Fanless heat vent
- 2** 24 volt power input
- 3** CAN daisy chain input/output
- 4** RS-232 console port
- 5** Power over Ethernet (PoE)
- 6** TTL input/output



- 1** High torque valve motors
- 2** Precision syringe drives with 48,000 step resolution over 60 mm
- 3** Limited power and prime buttons
- 4** Independent left and right trigger points

Microlab Software | Choosing a Controller

Hamilton conducted human factor studies to create a clear and understandable system that is communicated through a straightforward user interface. Each screen was thoughtfully designed to simplify the flow of each process and maximize its ease of use.

Basic Controller

The Basic Microlab 600 controller quickly performs standard dilutions and dispensing using a Quick Start screen.

Advanced Controller

The Advanced controller contains a significant number of additional features and allows users to create methods using air gaps, washing, repetitive dispensing, and more. For users with the Basic controller that would like to upgrade, it can be easily converted to the Advanced using a simple software kit (P/N 61500-02).



BASIC & ADVANCED FUNCTIONALITY COMPARISON

FEATURES	BASIC	ADVANCED
Quick Start Screen—Prime the instrument, program the dispense volume, and start dispensing	●	●
Graphical Pump Status—Animations of the fluid path display the current and future state of the syringe pump	●	●
Adaptive Dispense Control—Adjust dispense volumes in mid-process and the instrument will recalculate the remaining dispenses and proper time to refill	●	●
Configuration Guide—Step-by-step help to set up the instrument		●
Wizards—Dedicated Wizards for aliquot dispensing, serial dispensing, dilution, pipetting, and titration		●
Favorites Menu—Quickly access frequently used methods		●
Custom Method Programming—Create custom applications not covered by a Wizard		●
Enhanced Security—Meet 21 CFR Part 11 and FDA GMP/GLP requirements using custom security options		●
Method Storage—Create and run more than 1,000 methods on a single controller		●
Log File Creation—Create and store files on a memory card, or permanently on a PC using LyncStore™, to meet hardcopy archive requirements		●
Language Options—Operate the instrument in 10 languages		●
Software Upgrades—Download software updates and receive exciting new features		●

Hamilton Microlab 600 | Ordering Information

HAMILTON DUAL SYRINGE DILUTERS

PART NO	DESCRIPTION
CONCORDE HAND PROBE	
ML615-DIL	Dual Syringe Diluter with Basic Controller
ML625-DIL	Dual Syringe Diluter with Advanced Controller
DISPOSABLE TIP HAND PROBE	
ML625-DTHP	Microlab 600 Diluter with Disposable Tip Hand Probe
CLICKSURE TIPS FOR DTHP	
235537	50 µL, non-sterile ClickSure Tips, 960 tips, racked
235543	50 µL, non-sterile ClickSure Tips, 960 tips, bulk
235536	50 µL, sterile ClickSure Tips, 960 tips, racked
235539	1 mL, non-sterile ClickSure Tips, 960 tips, racked
235545	1 mL, non-sterile ClickSure Tips, 960 tips, bulk
235538	1 mL, sterile ClickSure Tips, 960 tips, racked

HAMILTON DISPENSERS

PART NO	DESCRIPTION
ML610-DIS	Single Syringe Dispenser with Basic Controller
ML620-DIS	Single Syringe Dispenser with Advanced Controller
ML615-DIS	Dual Syringe Dispenser with Basic Controller
ML625-DIS	Dual Syringe Dispenser with Advanced Controller
ML615-CNT	Dual Syringe Continuous Dispenser with Basic Controller
ML625-CNT	Dual Syringe Continuous Dispenser with Advanced Controller





Hamilton Microlab 600 Replacement Parts

Syringes

Select the smallest syringe with a maximum volume that is greater than the largest volume to be dispensed. Ideally the smallest volume to be dispensed should fall within the optimal ranges listed to the left. The Microlab 600 can dispense volumes below the optimal range but there will be some impact on accuracy and precision. The SaltLine Syringes should be used when working with solutions that have a high salt concentration.

HAMILTON SYRINGES		
PART NO	SYRINGE SIZE	OPTIMAL RANGE
STANDARD SYRINGES		
59000-05	10 µL	1 – 10 µL
59000-10	25 µL	2.5 – 25 µL
59000-15	50 µL	5 – 50 µL
59000-20	100 µL	10 – 100 µL
59000-25	250 µL	25 – 250 µL
59000-30	500 µL	50 – 500 µL
59000-35	1.0 mL	100 µL – 1.0 mL
59000-40	2.5 mL	250 µL – 2.5 mL
59000-45	5.0 mL	500 µL – 5.0 mL
59000-50	10.0 mL	1 – 10.0 mL
59000-55	25.0 mL	2.5 – 25.0 mL
59000-60	50.0 mL	5 – 50.0 mL
SALTLINE SYRINGES		
208335	1 mL	100 µL - 1.0 mL
208336	5 mL	500 µL - 5.0 mL
208337	10 mL	1 - 10.0 mL

Power Supply & Power Cords

HAMILTON POWER SUPPLY & POWER CORDS		
PART NO	DESCRIPTION	DIAGRAM OF PLUG
POWER SUPPLY		
61092-01	Power Supply Universal (110–220 VAC)	N/A
POWER CORDS		
3892-01	Continental Europe, Russia, Schuko	
3892-02	Australia, New Zealand, Argentina, China	
3892-03	UK, Ireland, Malaysia, Middle East	
3892-05	USA, Canada, Mexico, Central America, Brazil, Japan	



Hamilton Valves, Tubing, Upgrade Kits & Miscellaneous Accessories

Universal Valves & Accessories

HAMILTON UNIVERSAL VALVES & ACCESSORIES	
PART NO	VALVE ASSEMBLY
60676-01	Left Valve Assembly
60675-01	Right Valve Assembly
61498-01	Valve Cross Tube Assembly
61729-01	Valve Plug



PTFE Tubing Assemblies

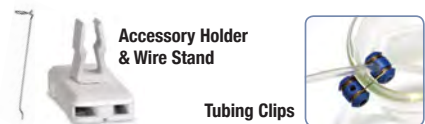
HAMILTON PTFE TUBING ASSEMBLIES				
PART NO	GAUGE	TYPE	LENGTH	INTERNAL VOLUME
61615-01	18	Fill Tubing	48" (1219 mm)	1.15 mL
240134	18	Dispense Tubing	54" (1372 mm)	1.29 mL
1174-02	18	Fill Tubing	Custom Length	0.94 µL/mm
1173-02	18	Dispense Tubing	Custom Length	0.94 µL/mm
61614-01	12	Fill Tubing	48" (1219 mm)	4.57 mL
240133	12	Dispense Tubing	54" (1372 mm)	5.15 mL
1172-02	12	Fill Tubing	Custom Length	3.75 µL/mm
1171-02	12	Dispense Tubing	Custom Length	3.75 µL/mm
61491-02	18	Continuous Fill Tubing		0.94 µL/mm
61491-01	12	Continuous Fill Tubing		3.75 µL/mm

Fill & Dispense Tubing
(Dispense tubing has tapered end)



Upgrade Kit

HAMILTON UPGRADE KIT		
PART NO	UPGRADE KIT	INCLUDES
61500-02	Basic to Advanced Controller Upgrade Kit	Advanced manual, 2 GB SD card, SD to USB converter, and programmer software CD
61500-03	Custom Programmer Kit (Compatible with Microsoft® .NET 2.0 and higher)	Programmer software CD with manual, Application Programming Interface, and example LabView™, Visual C#® and Visual Basic® programs.



Misc. Accessories

HAMILTON UNIVERSAL VALVES & ACCESSORIES	
PART NO	DESCRIPTION
88990	Tubing Clips (5/pk)
61710-01	Accessory Holder & Tubing Wire Stand
65160-01	Cable Management System

Hamilton Hand Probes, Foot Switch & Printer Kit

HAMILTON AIRSHIELD, HAND PROBES, FOOT SWITCH AND PRINTER KIT

PART NO	DESCRIPTION
58381-01	Luer Lock Conversion Kit
61401-01	Concorde CT Hand Probe
62541-01	Dual Push Button Hand Probe
63960-02	Disposable Tip Hand Probe (0.5 - 1000 µL)*
62575-01	Large Volume Disposable Tip Hand Probe (1 - 5 mL)
75702	5 mL Disposable Tips (250/pk)
62576-01	Foot Switch
68562-01	AirShield
93009-01	AirShield Tubing (includes tubing clamp)
61500-04	Microlab Printer

* Tips for this probe can be found on page 424.



58381-01
Luer Lock
Conversion Kit



61401-01
(Standard with the Single Syringe
Dispenser, Dual Syringe Diluter,
and Continuous Dispenser)



62541-01
(Standard with the Dual
Syringe Dispenser)



63960-02
(0.5 - 1,000 µL)



62575-01
(1 - 5 mL)
For sensitive applications,
the sample is aspirated into a
disposable plastic tip which
is thrown away between
each sample, eliminating any
change for carryover.



62576-01



68562-01

The AirShield is a separate accessory that can be purchased for any Microlab 600 instrument. It creates a positive pressure blanket of fresh air inside the pump that pushes air out over critical components on the outside of the pump, protecting them from the environment.

Hamilton Standalone Syringe Pumps

Take full command of your diluting and dispensing applications with the Microlab 600 standalone syringe pump. The standalone syringe pump allows you to custom program methods and deploy commands to any instrument on your network from anywhere in the world.

HAMILTON STANDALONE PUMP

PART NO	DESCRIPTION
ML630	Single Syringe Pump
ML635	Dual Syringe Pump

All standalone pumps ship complete with a universal valve(s), country-specific power cord, Custom Programmer kit, and choice of syringes. If no syringe(s) is/are selected at the time of the order 1 mL syringe(s) will be included automatically.



Spectroscopy

Agilent Supplies for ICP-OES,
ICP-MS & MP-AES 436

4100/4200/4210 Series MP-AES 436

Agilent 5100/5110 Series ICP-OES 436

Agilent 7700/7900/8800/8900 Series ICP-MS 437

Agilent Supplies for AA 438

Agilent Coded Single Element Lamps 438

Agilent Coded Multi-Element Lamps 438

Agilent Background Correction Lamps 438

Graphite Furnace AA Supplies 439

Agilent Supplies for UV/VIS 439



Agilent Technologies

Featured Products

Spectroscopy Supplies Portfolio by Instrument

	MP-AES	ICP-OES	ICP-MS	Flame AA	GFAA
SAMPLE INTRODUCTION COMPONENTS					
Nebulizers/spray chambers	●	●	●	●	
Capillaries, peristaltic pump tubing, etc.	●	●	●	●	●
OTHER SUPPLIES					
Interface cones and ion lenses			●		
CHEMICAL STANDARDS					
Calibration standards	●	●	●	●	●
SOURCE LAMPS					
Hollow cathode lamps				●	●
Deuterium lamp (background corrector)				●	●
SAMPLE ATOMIZER COMPONENTS					
Graphite tubes, electrodes and shrouds					●

Notes from the Support Desk

Torch Cleaning Stand simplifies the cleaning process

Agilent MP-AES & ICP-OES instrument users running their instruments regularly with challenging samples (such as those with high levels of dissolved solids) use multiple torches, which need regular cleaning. To help users achieve maximum usable life from their Easy-fire torches, we recommend cleaning the torch as soon as any discoloration appears on the outer tube, or as soon as there is any visible blockage on the injector.

The new torch cleaning stand provides a convenient way for users to clean their easy fit torches and makes it easier and safer for them.

Benefits of the cleaning stand

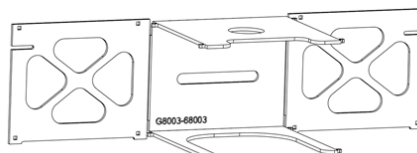
- ➔ Provides a stable platform to enable the complete torch assembly (including the outer tube and injector) to be suspended in the acid cleaning solution
- ➔ Encloses the container for the acid cleaning solution, reducing the chance of accidental spillage
- ➔ Prevents damage to the fragile end of the quartz outer tube from contact with the base of the container for the acid cleaning solution (especially when using a glass container for cleaning)
- ➔ Reduces premature degradation of the elastomer materials on the torch body. The seal between the torch body and the torch plate limits exposure to acid fumes from the acid cleaning solution.



G8003-68003
Torch cleaning stand for 4200/4210 MP-AES
G8010-68021
Torch cleaning stand for 5100/5110 ICP-OES

Using the cleaning stand

The base for the torch cleaning stand is easily assembled by folding the stand into shape and pushing the retaining lugs firmly through the holes on both sides of the stand.



Agilent Spectroscopy Supplies | ICP-OES, ICP-MS, & MP-AES

Agilent 4100/4200 Series MP-AES Supplies

AGILENT 4100/4200 SERIES MP-AES SUPPLIES	
DESCRIPTION	PART NO
TORCHES & SUPPLIES	
Easy-fit torch for 4200 MP-AES, Features a blue base for easy identification. Suitable for the 4200 MP-AES only	G8003-70000
Easy-fit torch for 4100 MP-AES	G8000-70002
Torch cleaning stand for 4200/4210 MP-AES	G8003-68003
NEBULIZERS & SUPPLIES	
Concentric nebulizer, use w/aqueous samples & normal digests	G8000-70004
PUMP & CONNECTING TUBING	
Pump tubes for aqueous sample, PVC, white/white, 12/pk	3710034400
Pump tubes for organic samples and high TDS aqueous samples, Solvaflex, orange/green, 12/pk	3710068000
Pump tubes, flared ends, for organic samples and high TDS aqueous samples, Solvaflex, orange/green, 12/pk	3710068100
SPRAY CHAMBERS & SUPPLIES	
Spray chamber, single pass, glass, cyclonic	G8000-70006
Spray chamber, double pass, glass cyclonic	G8000-70007
Inert cyclonic spray chamber, single pass, for HF solutions	G8000-70008
WAVELENGTH CALIBRATION SOLUTIONS	
Wavelength calibration solution, 500 mL. Contains 50 mg/L Al, As, Ba, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sr, Zn and 500 mg/L K in 5% HNO ₃ + tr HF. Dilute x10 before use.	6610030000
Wavelength calibration solution, 500 mL. Contains 5 mg/L Al, As, Ba, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sr, Zn and 50 mg/L K in 5% HNO ₃ + tr HF. Ready to use.	6610030100

Agilent 5100 Series ICP-OES Supplies

AGILENT 5100 SERIES ICP-OES SUPPLIES	
DESCRIPTION	PART NO
NEBULIZERS & SUPPLIES	
Concentric glass nebulizer, SeaSpray U Series with Ezylok, standard for 5100	G8010-60255
Concentric glass nebulizer, Conikal U Series with Ezylok Recommended for HF and high TDS solutions	G8010-60270
OneNeb inert concentric nebulizer Recommended for HF and high TDS solutions	2010126900
PUMP & CONNECTING TUBING	
Peristaltic pump tubing, PVC, white/white, 12/pk	3710034400
Peristaltic pump tubing, PVC, blue/blue, 12/pk	3710034600
Peristaltic pump tubing, PVC, black/black, 12/pk	3710027200
Peristaltic pump tubing, PVC, orange/white, 12/pk	3710046900
SPRAY CHAMBERS	
Spray chamber, dbl pass glass cyclonic, standard for 5100	G8010-60256
Spray chamber, single pass glass cyclonic	G8010-60271
Inert double pass spray chamber, white, re. for HF samples	G8010-80034
Inert single pass spray chamber, white	G8000-70008

(continued)

AGILENT 5100 SERIES ICP-OES SUPPLIES (CONT.)	
DESCRIPTION	PART NO
TORCHES & SUPPLIES (5100-SVDV/VDV TORCHES FOR USE IN BOTH AXIAL & RADIAL VIEWS)	
Easy-fit torch, one piece with 1.8 mm ID injector and an extended outer tube with slot, standard for 5100 SVDV/VDV	G8010-60228
Easy-fit torch, demountable w/1.8 mm ID injector, extended outer tube with slot & replaceable inner/outer tube set	G8010-60236
Easy-fit torch, demountable, high solids w/2.4 mm ID injector, ext. outer tube w/slot & replaceable inner/outer tube set	G8010-60232
Easy-fit torch, demountable, semi-volatile organics, w/1.4 mm ID inj., ext. outer tube w/slot & replaceable inner/outer tube set	G8010-60233
Easy-fit torch, inert, demountable for HF digests, with 1.8 mm ID ceramic injector, an ext. outer tube with slot & replaceable inner/outer tube set	G8010-60231
Quartz outer tube set for demountable torch, comprises ext. length outer tube w/slot, intermediate tube (integrated) & top seal	G8010-60263
Torch cleaning stand for 5100/5110 ICP-OES	G8010-68021
TORCHES & SUPPLIES (5100-RV TORCHES FOR DEDICATED RADIAL VIEWING)	
Easy-fit torch, one piece with 1.4 mm ID injector, shorter outer tube (no slot), standard for 5100 RV	G8012-60000
Easy-fit torch, demountable with 1.4 mm ID injector, shorter outer tube (no slot) & replaceable inner/outer tube set	G8010-60237
Easy-fit torch, demountable, volatile organics, w/0.8 mm ID injector, shorter outer tube (no slot) & repl inner/outer tube set	G8010-60235
Easy-fit torch, inert, demountable for HF digest, w/1.8 mm ID ceramic injector, shorter outer tube (no slot) & repl inner/outer tube set	G8010-60234
Quartz outer tube set for demountable torch Comprises shorter length outer tube (no slot), intermediate tube (integrated) & top seal	G8010-60264
MISCELLANEOUS 5100 TORCH SUPPLIES	
Torch clamp, to clamp the spray chamber to the all joint on the torch (not suitable for inert torch)	G8000-64140
Torch clamp for inert, demountable torch. Clamps the inert spray chamber to base of inert torch. Not suitable for std torch	G8010-60227
WAVELENGTH CALIBRATION SOLUTIONS	
ICP-OES wavelength calibration solution, 500 mL Contains 50 mg/L Al, As, Ba, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sr, Zn and 500 mg/L K in 5% HNO ₃ + tr HF. Dilute x10 before use.	6610030000
ICP-OES wavelength calibration solution, 500 mL Contains 5 mg/L Al, As, Ba, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sr, Zn and 50 mg/L K in 5% HNO ₃ + tr HF. Ready to use.	6610030100
ICP-OES calibration blank solution, 500 mL Pure ASTM Type 1A water with 5% HNO ₃ , For use as cal. blank or diluent for the wavelength cal. solution	5190-7001



Agilent Spectroscopy Supplies | ICP-OES, ICP-MS, & MP-AES (cont.)

Agilent 7700/7900/8800 Series ICP-MS Supplies

AGILENT 7700/7900/8800 SERIES ICP-MS SUPPLIES	
DESCRIPTION	PART NO
SPRAY CHAMBER SUPPLIES	
Spray chamber (quartz)	G380-80008
End cap	G3280-60008
Connector between spray chamber and torch (quartz)	G3270-80025
Connector tube with dilution port for HMI (quartz)	G3270-80024
Clamps to join connector tube to spray chamber or torch	G1833-65430
Spray chamber for UHMI used with 7900	G8400-67150
Clamps to join 7900 Series UHMI connector tube to spray chamber or torch	G8400-60327
Endcap retainer ring for spray chamber for UHMI	G8400-40200
Dilution nozzle, UHMI, 7900 ICP-MS	G8400-67026
TUBING	
Peri-pump sample tubing, tygon, 1.02 mm ID, 40 cm, 12/pk	G1833-65569
Peri-pump tubing for ISTD, 0.25 mm ID, 12/pk	G3280-67047
SAMPLER CONES AND SUPPLIES	
Graphite gasket for sampling cone, 3/pk	G3280-67009
Nickel sampling cone (standard for 7700x/e, 7900 and 8800)	G3280-67040
Platinum sampling cone (standard for 7700s, 7900 and 8800 semicon configuration; also for 7700x/e and 8800)	G3280-67036
Ni plated sampling cone (recommended when samples containing > 0.5% HCl are analyzed and when using max. HMI aerosol dilution)	G3280-67061
SKIMMER CONES & BASES FOR 8800/7700 SERIES	
Nickel skimmer (standard for 7700x/e and 8800)	G3280-67041
Stainless steel skimmer base for nickel skimmer (for 7700x/e and 8800)	G3280-60608
Platinum skimmer, Cu base (standard for 7700s and 8800 semicon configuration [requires brass skimmer base])	G3280-67064
Platinum skimmer, Ni base for 7700x/e and 8800 (recommended for organics analysis - requires brass skimmer base)	G3280-67063
Platinum skimmer, Cu base for 7700x/e and 8800 (recommended for best LODs and with higher matrix samples [requires brass skimmer base])	G3280-67060
Brass skimmer base for 7700x/e and 8800 (required for use with Pt skimmer)	G3280-60621
Brass skimmer base for 7700s and 8800 semicon configuration (required for use with Pt skimmer)	G1833-65590

(continued)



7700 Series ICP-MS



G1833-65569



G3280-60008

AGILENT 7700/7900/8800 ICP-MS SUPPLIES (CONT.)	
DESCRIPTION	PART NO
SKIMMER CONES & BASES FOR 7900 SERIES	
Nickel skimmer (standard for 7900 with x lens)	G8400-67200
Stainless steel skimmer base for 7900 with x lens (required for use with Ni skimmer)	G8400-60624
Platinum skimmer, Cu base (for 7900 with x lens, recommended for best LODs and with higher matrix samples [requires brass skimmer base])	G8400-67201
Platinum skimmer, Ni base for 7900 with x lens (recommended for organic analysis - requires brass skimmer base)	G8400-67202
Brass skimmer base for 7900 with x lens (required for use with Pt skimmer)	G8400-60625
Platinum skimmer, Cu base (standard for 7900 with s lens [requires brass skimmer base])	G3280-67064
Brass skimmer base for 7900 with s lens (required for use with Pt skimmer)	G8400-60626
TORCH	
Torch (quartz), 2.5 mm ID	G3280-80053
Torch (quartz), 1.5 mm ID taper type for use with organics	G3280-80080
Torch (quartz), 1.0 mm ID taper type for use with organics	G3280-80081
Bonnet (quartz ring for shield torch)	G1833-65421
NEBULIZERS & SUPPLIES	
MicroMist nebulizer, U-series (standard for 7900)	G3266-80004
MicroMist nebulizer (standard for 7700x/e and 8800)	G3266-65003
TUNING SOLUTIONS	
Stock tuning solution: Li, Y, Ce, Tl and Co; 100 mL, 10 mg/L; matrix 2% HNO ₃	5188-6564
Tuning solution: Li, Y, Ce, Tl and Co; 2 x 500 mL, 10 µg/L; matrix 2% HNO ₃	5184-3566
QUIET COVER FOR VACUUM PUMP	
Quiet Cover DS for Agilent vacuum pump models DS202, DS302, DS402, DS602	G6012A

G3266-65003



G3270-80024



G3280-80053



G1833-65421



G3280-67040



G3280-67060



G3280-60608



Removable oil tray



Easy access to pump

G6012A
Quiet Cover DS for Agilent vacuum pump models DS202, DS302, DS402, DS602

Agilent Coded Hollow Cathode Lamps for all Agilent AA Systems

AGILENT CODED SINGLE ELEMENT LAMPS		
ELEMENT	CODED LAMP	UltraAA CODED LAMP
Aluminum – Al	5610100100	–
Antimony – Sb	5610100200	5610108000
Arsenic – As	5610100300	5610108100
Barium – Ba	5610100400	–
Beryllium – Be	5610100500	–
Bismuth – Bi	5610100600	5610134200
Boron – B	5610100700	5610135700
Cadmium – Cd	5610100800	–
Calcium – Ca	5610101000	–
Chromium – Cr	5610101200	–
Cobalt – Co	5610101300	5610134100
Copper – Cu	5610101400	5610109100
Germanium – Ge	–	5610134300
Gold – Au	5610102100	5610109000
Hafnium – Hf	5610102200	–
Iridium – Ir	5610102600	–
Iron – Fe	5610102700	5610108600
Lead – Pb	5610102900	5610108200
Lithium – Li	5610103000	–
Magnesium – Mg	5610103200	–
Manganese – Mn	5610103300	5610133700
Mercury – Hg	5610103400	–
Molybdenum – Mo	5610103500	–
Neodymium – Nd	5610103600	–
Nickel – Ni	5610103700	5610108500
Niobium – Nb	5610103800	–
Palladium – Pd	5610104000	5610135800
Phosphorus – P	5610107700	–
Platinum – Pt	5610104100	5610135900
Potassium – K	5610104200	–
Rhenium – Re	5610104400	–
Rhodium – Rh	5610104500	–
Selenium – Se	5610105000	5610108300
Silicon – Si	5610105100	5610133400
Silver – Ag	5610105200	–
Sodium – Na	5610105300	–
Strontium – Sr	5610105400	–
Tantalum – Ta	5610105500	–
Tellurium – Te	5610105600	5610134000
Thallium – Tl	5610105800	5610108400
Tin – Sn	5610106100	5610133900
Titanium – Ti	5610106200	–
Vanadium – V	5610106500	–
Zinc – Zn	5610106800	–
Zirconium – Zr	5610106900	–

Agilent Coded Single-Element Lamps

- ➔ Manufactured from the purest cathode materials
- ➔ Coded for automatic lamp recognition, preventing errors



5610101400



5610108100

Agilent Coded Multi-Element Lamps

- ➔ Primary lines checked to avoid and minimize spectral interferences



5610109600



5610108900

AGILENT CODED MULTI-ELEMENT LAMPS		
ELEMENT	CODED LAMP	UltraAA CODED LAMP
Aluminum/Calcium/Magnesium	5610108800	5610133600
Calcium/Magnesium	5610107100	–
Cobalt/Chromium/Copper/Iron/Manganese/Nickel	5610107600	5610134500
Cobalt/Molybdenum/Lead/Zinc	–	5610135200
Copper/Iron/Manganese/Zinc	5610109600	5610135000
Copper/Iron/Silicon/Zinc	5610109700	5610135100
Copper/Zinc	5610119200	5610134600
Silver/Cadmium/Lead/Zinc	5610108700	5610108900
Silver/Chromium/Copper/Iron/Nickel	5610109500	5610134900
Sodium/Potassium	5610107000	–

TECH TIP

The difference between coded lamps and UltraAA coded lamps

UltraAA lamp's emission intensity is increased by 3 – 5 times, for lower noise. Sensitivity is increased by up to 40%, due to the sharper emission profile, allowing determinations at even lower levels.

Agilent Background Correction Lamps

AGILENT BACKGROUND CORRECTION LAMPS	
ELEMENT	PART NO
Deuterium background correction lamp for AA systems	G8431-80000

Deuterium background correction is only useable over the range from 185 – 430 nm. At higher wavelengths, there is no usable output from the lamp.



Agilent Graphite Furnace Atomic Absorption Supplies

Use partition tubes for general purpose work and when you need the best detection limits with samples that have low background.

Omega platform tubes combine ease-of-use with perfect atomization: the integrated platform ensures the perfect thermal profile to produce dense atom clouds for good signal-to-noise ratios and the best detection limits.

The combination of the solid pyrolytic platforms and plateau tubes provide continuity with older methods, and gives the best platform effect. This ensures best performance with samples that have high background or interferences. More operator skill is required for best results.



TUBES AND PLATFORMS FOR GTA 120 AND GTA 120 ZEEMAN

DESCRIPTION	PART NO
Partitioned tubes, pyrolytically coated, 10/pk	6310001200
Omega platform tubes, pyrolytically coated, 10/pk	6310003700
Plateau tubes, pyrolytically coated, for pyrolytic platforms, 10/pk	6310001300
Solid pyrolytic graphite platforms, for plateau tubes 10/pk	6310001100

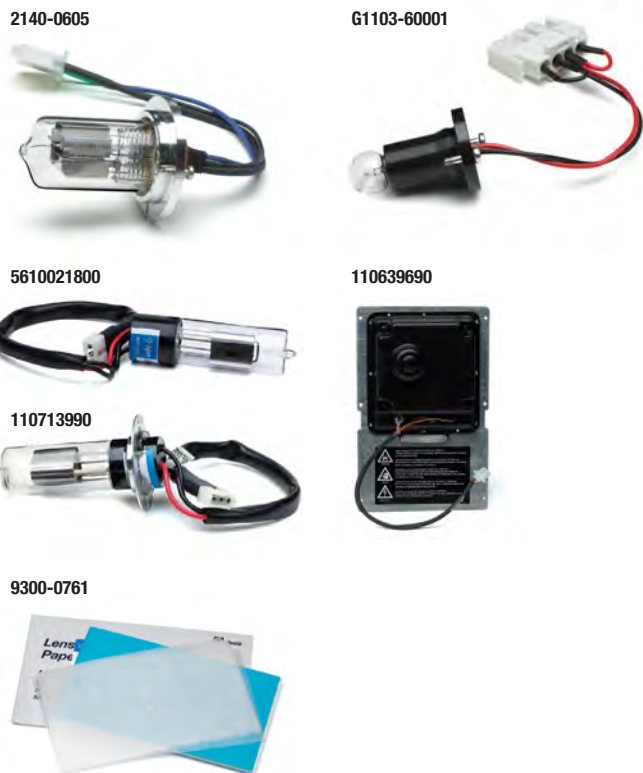
Agilent 8453/8454 & Cary UV/VIS Supplies

AGILENT SPECTROPHOTOMETER LAMPS

PART NO	DESCRIPTION	COMMENTS
2140-0605	Deuterium lamp assembly	For 8453/8454
G1103-60001	Tungsten lamp assembly	For 8453-8454
5610021800	Deuterium lamp	For Cary 100/300
5610021700	Visible source lamp	For Cary 100/300
110639690	Xenon lamp module	For Cary 50/60
5610135500	UV Source lamp, less than 190 nm	For Cary 400
110713990	Deuterium UV lamp	For Cary 4000 to 6000i
5610013900	Visible QI lamp	For Cary 4000 to 6000i

AGILENT SPECTROPHOTOMETER MISCELLANEOUS CELL SUPPLIES

PART NO	DESCRIPTION
5190-0530	Cell cleaning solution, 1 L
9300-0761	Lens cleaning paper, lint-free
5063-6577	Tray for 16 cells



Solvents & Reagents

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**MILLIPORE
SIGMA**

 **REGIS**[®]
TECHNOLOGIES, INC.

Featured Products

442 Acetonitrile

**MILLIPORE
SIGMA**

446 Methanol

**MILLIPORE
SIGMA**

458 Regis Guide to GC Derivatization Methods



Notes from the Support Desk

Millipore Sigma Redi-Dri™ Salts

A common issue for hygroscopic powders is they tend to clump and become difficult to break up. Millipore Sigma set out to find an innovative solution to address this issue. We have created a proprietary packaging system that prevents solids, such as inorganic salts, from absorbing moisture regardless of the number of times you open the bottle or how humid the environment may be. This unique packaging solution provides many benefits such as:

Reduced costs—Minimize the need to break up solids, thus reducing your labor costs and saving you valuable lab time

Safer to use—Reduce the risk of injury and contamination by eliminating the need to chip away at solids

Longer shelf life—Redi-Dri remains free-flowing even after repeated exposures to air

Less waste—No need to discard unusable material

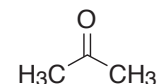


Millipore Sigma Sure/Seal™ Bottles

The Sure/Seal bottle incorporates the inert composition of our amber glass bottles with a time-tested crimp-top system. This design ensures the exceptional state of dryness achieved at time of purification is maintained throughout long-term storage and use. Before filling, low levels traces of moisture are removed from the bottle through oven drying. The bottles are then filled under an inert atmosphere of dry nitrogen to prevent moisture build-up and sealed with our unique Sure/Seal liner and crown cap.



Acetone



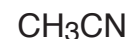
ACETONE SPECIFICATIONS		
Grade:	ACS reagent	HPLC Grade
Assay:	≥99.5%	≥99.9%
Impurities:	≤0.0003 meq/g Titr. acid ≤0.0006 meq/g Titr. base ≤0.002% aldehyde as formaldehyde ≤0.05% isopropanol ≤0.05% methanol ≤0.5% water	≤0.5% water

ACETONE ORDERING INFORMATION		
PART NO-PACK SIZE	GRADE	CONTAINER
179124-4X4L	ACS reagent, ≥ 99.5%	glass bottle
179124-20L	ACS reagent, ≥ 99.5%	steel drum
270725-4X4L	HPLC grade, ≥ 99.9%	glass bottle

CAS Number	67-64-1
Linear Formula	CH ₃ COCH ₃
Molecular Weight	58.08
Beilstein Registry Number	635680
EC Number	200-662-2
MDL Number	MFCD00008765
PubChem Substance ID (ACS)	24850797
PubChem Substance ID (HPLC)	24856392

Acetone is a commonly used material in the manufacture of various chemicals. These chemicals include methyl isobutyl ketone, mesityl oxide, diacetone alcohol, acetic acid (via the ketene process), iodoform, and bromoform. Other products where acetone is utilized in manufacture include rayon, photographic films, and paint and varnish removers. In chemical synthesis, acetone has been utilized in the synthesis and isolation of both organic and inorganic compounds and complexes. These include t-butanesulfonamide, terpenes, thiol-stabilized gold colloids, calixphyrin macrocycles, and trispyrazolylborate platinum compounds. Acetone is also used in HPLC analysis of organic and inorganic species, including gold nanoparticle clusters and plant oils. Acetone has been utilized in protein crystallization.

Acetonitrile



ACETONITRILE SPECIFICATIONS			
Grade:	ACS reagent	Anhydrous	HPLC Plus grade
Assay:	≥99.5%	99.8%	≥99.9%
Impurities:	≤0.3% water ≤0.6 µeq/g Titr. base ≤8 µeq/g Titr. aci	<0.001% water <0.005% water (100 mL pkg)	≤0.0001% free alkali (as NH ₃) ≤0.0002% non-volatile matter ≤0.001% free acid (as CH ₃ COOH) ≤0.01% water (Karl Fischer) ≤0.5 ppb fluorescence (quinine) at 254 nm ≤0.5 ppb fluorescence (quinine) at 365 nm

ACETONITRILE ORDERING INFORMATION		
PART NO-PACK SIZE	GRADE	CONTAINER
360457-4X4L	ACS reagent, ≥ 99.5%	glass bottle
271004-100ML	anhydrous, 99.8%	Sure/Seal™
271004-1L	anhydrous, 99.8%	Sure/Seal™
34998-1L	HPLC Plus grade, ≥ 99.9%	glass bottle
34998-6X1L	HPLC Plus grade, ≥ 99.9%	glass bottle
34998-4L	HPLC Plus grade, ≥ 99.9%	glass bottle
34998-4X4L	HPLC Plus grade, ≥ 99.9%	glass bottle

Synonym	ACN, Methyl cyanide
CAS Number	75-05-8
Linear Formula	CH ₃ CN
Molecular Weight	41.05
Beilstein Registry Number	741857
EC Number	200-835-2
MDL Number	MFCD00001878
PubChem Substance ID (anhydrous)	24856425
PubChem Substance ID (HPLC)	24861719

Acetonitrile is a widely used, polar aprotic organic solvent. Acetonitrile is utilized as a starting material for the production of such compounds as acetophenone, α-naphthaleneacetic acid, thiamine, and acetamidine. It can be used in the recrystallization of steroids and as a solvent for non-aqueous titrations, as well as a non-aqueous solvent for inorganic salts. In analytical chemistry, acetonitrile is utilized in such areas as biopartitioning studies, in the HPLC analysis of small organic compounds, and enantiomer resolution by LC on polysaccharide type chiral stationary phases.

Chloroform



CHLOROFORM SPECIFICATIONS

Grade:	Anhydrous	HPLC grade
Assay:	≥99%	≥99.8%
Impurities:	<0.001% water <0.005% water (100 mL pkg)	Acetone and aldehyde, passes test Acid and chloride, passes test Free chlorine (Cl), passes test H ₂ SO ₄ , passes test(darkened) ≤0.01% water

CHLOROFORM ORDERING INFORMATION

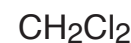
PART NO-PACK SIZE	GRADE	CONTAINER
288306-1L	anhydrous, 99%, contains <i>ethanol</i> as stabilizer	Sure/Seal™
372978-1L	anhydrous, 99%, contains <i>amylene</i> as stabilizer	Sure/Seal™
366927-4X4L	HPLC grade, ≥ 99.8%	glass bottle

Synonym Methylidyne trichloride, Trichloromethane

CAS Number	67-66-3
Empirical Formula (Hill Notation)	CHCl ₃
Molecular Weight	119.38
Beilstein Registry Number	1731042
EC Number	200-663-8
MDL Number	MFCD00000826
PubChem Substance ID (anhydrous)	24863186
PubChem Substance ID (HPLC)	24862727

Chloroform is a widely used organic solvent in biochemistry and molecular biology. Procedures have been described for the use of chloroform in λ plaques storage, for λ cDNA storage, the removal of mineral oil from PCR reaction samples, oligonucleotide purification, a hydroxyl radical footprinting protocol, a transcriptional run-on assay protocol, and an overlay assay for β-galactosidase activity. Chloroform has been used with phenol in such procedures as DNA recovery from polyacrylamide gels, ethidium bromide removal from DNA preparations, lysis protocols for plasmid DNA isolation, RNase removal, and purification of yeast DNA. A protocol describes the use of chloroform in a high-performance thin-layer chromatography protocol for sphingomyelin analysis.

Dichloromethane



DICHLOROMETHANE SPECIFICATIONS

Grade:	ACS reagent contains <i>amylene</i> as stabilizer	Anhydrous contains 50 – 150 ppm	HPLC grade contains <i>amylene</i> as stabilizer
Assay:	≥99.5%	≥99.8%	≥99.8%
Impurities:	Free halogens, passes test ≤0.0003 meq/ g Titr. acid ≤0.02% water	≤0.001% water ≤0.005% water (100 mL pkg)	free chlorine, in accordance ≤0.001% free acid (as HCl) ≤0.001% non-volatile matter ≤0.02% water (Karl Fischer)

DICHLOROMETHANE ORDERING INFORMATION

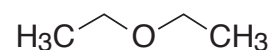
PART NO-PACK SIZE	GRADE	CONTAINER
D65100-4X4L	ACS reagent, ≥ 99.5%	glass bottle
D65100-20L	ACS reagent, ≥ 99.5%	steel drum
270997-1L	anhydrous, 99.8%	Sure/Seal™
270997-6X1L	anhydrous, 99.8%	Sure/Seal™
34856-4X4L*	HPLC grade, ≥ 99.8%	glass bottle

*Preparation Note: Product filtered through a 0.2 μm filter

Synonym Methylene chloride

CAS Number	75-09-2
Empirical Formula (Hill Notation)	CH ₂ Cl ₂
Molecular Weight	84.93
Beilstein Registry Number	1730800
EC Number	200-838-9
MDL Number	MFCD00000881
PubChem Substance ID (ACS)	24894031
PubChem Substance ID (anhydrous)	24894031
PubChem Substance ID (HPLC)	24861586

Diethyl Ether



DIETHYL ETHER SPECIFICATIONS

Grade:	ACS reagent/Anhydrous, contains BHT as inhibitor
Assay:	≥99.5%
Impurities:	Alcohol (as CH ₃ CH ₂ OH), passes test ≤0.0002 meq/g Tit. acid, ≤0.001% Carbonyl (as HCHO), ≤0.03% Water, ≤1 ppm Peroxide (as H ₂ O ₂)

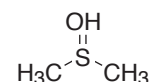
DIETHYL ETHER ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
673811-4X4L	ACS reagent/anhydrous, 99.0%	aluminum bottle

Synonym Ether, Ethyl ether

CAS Number	60-29-7
Linear Formula	(CH ₃ CH ₂) ₂ O
Molecular Weight	74.12
Beilstein Registry Number	1696894
EC Number	200-467-2
MDL Number	MFCD00011646
PubChem Substance ID	24885180

Dimethyl Sulfoxide



DIMETHYL SULFOXIDE SPECIFICATIONS

Grade:	Anhydrous	Plus HPLC grade
Assay:	≥99.9%	≥99.7%
Impurities:	<0.005% water	≤0.002% non-volatile matter ≤0.2% water (Karl Fischer)

DIMETHYL SULFOXIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
276855-1L	anhydrous, 99%	Sure/Seal™
34869-6X1L	HPLC Plus grade, ≥ 99.7%	glass bottle
34869-4X4L	HPLC Plus grade, ≥ 99.7%	glass bottle

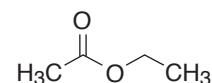
Synonym DMSO, Methyl sulfoxide

CAS Number	67-68-5
Linear Formula	(CH ₃) ₂ SO
Molecular Weight	78.13
Beilstein Registry Number	5060084
EC Number	200-664-3
MDL Number	MFCD00002089
PubChem Substance ID (anhydrous)	24856722
PubChem Substance ID (HPLC)	24861602

TECH TIP

Supercools easily and remelts slowly at room temperature. Solidified product can be re-liquified by warming to room temperature without detriment to the product.

Ethyl Acetate



ETHYL ACETATE SPECIFICATIONS

Grade:	Anhydrous	HPLC grade
Assay:	99.8%	≥99.7%
Impurities:	<0.005% water	≤0.0005% non-volatile matter ≤0.005% free acid (as CH ₃ COOH) ≤0.03% water (Karl Fischer)

ETHYL ACETATE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
270989-1L	anhydrous, 99.8%	Sure/Seal™
34858-4X4L	HPLC grade, ≥ 99.7%	glass bottle

Synonym EtOAc

CAS Number	141-78-6
Linear Formula	CH ₃ COOC ₂ H ₅
Molecular Weight	88.11
Beilstein Registry Number	506104
EC Number	205-500-4
MDL Number	MFCD00009171
PubChem Substance ID (anhydrous)	24856422
PubChem Substance ID (HPLC)	248615892

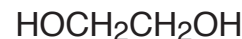
Ethylene Glycol

ETHYLENE GLYCOL

Grade:	Anhydrous
Assay:	99.8%
Impurities:	<0.003% water <0.005% water (100 mL pkg)

ETHYLENE GLYCOL ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
324558-1L	anhydrous, 99.8%	Sure/Seal™
324558-6X1L	anhydrous, 99.8%	Sure/Seal™



Synonym 1,2-Ethanediol

CAS Number	107-21-1
Linear Formula	$\text{HOCH}_2\text{CH}_2\text{OH}$
Molecular Weight	62.07
Beilstein Registry Number	505945
EC Number	203-473-3
MDL Number	MFCD00002885
PubChem Substance ID	24859450

Formaldehyde solution

FORMALDEHYDE SOLUTION SPECIFICATIONS

Grade:	ACS reagent
Assay:	36.5-38.0%
Impurities:	≤0.006 meq/g Titr. acid

FORMALDEHYDE SOLUTION ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
252549-500ML	ACS reagent, 37 wt. % in H ₂ O, contains 10-15% Methanol	glass bottle



Synonym Formalin

CAS Number	50-00-0
Linear Formula	HCHO
Molecular Weight	30.03
Beilstein Registry Number	1209228
EC Number	200-467-2
MDL Number	MFCD00003274
PubChem Substance ID	24855218

This product is a solution of approximately 37% by weight of formaldehyde gas in water. The product contains 10-15% methanol as a stabilizer to prevent polymerization. It is designated as an ACS Reagent, meeting the specifications of the ACS for reagent chemicals.

Heptane

HEPTANE SPECIFICATIONS

Grade:	ReagentPlus®	HPLC grade
Assay:	99.5%	≥99%
Impurities:		≤0.0005% non-volatile matter, ≤0.001% free acid (as CH ₃ COOH), ≤0.01% water (Karl Fischer) ≤1 ppb fluorescence (quinine) at 254 nm ≤1 ppb fluorescence (quinine) at 365 nm

HEPTANE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
H2198-4X4L	ReagentPlus®, 99.5%	glass bottle
H2198-20L	ReagentPlus®, 99.5%	steel drum
34873-4X4L	HPLC grade, ≥ 99%	glass bottle



CAS Number	142-82-5
Linear Formula	$\text{CH}_3(\text{CH}_2)_5\text{CH}_3$
Molecular Weight	100.20
Beilstein Registry Number	1730763
EC Number	205-563-8
MDL Number	MFCD00009544
PubChem Substance ID (HPLC)	24861609

Hexane, mixture of isomers



HEXANE SPECIFICATIONS

Grade:	ACS reagent	Anhydrous	HPLC grade
Assay:	≥98.5%	≥99%	≥98.5%
Impurities:	thiophene, passes test ≤0.0003 meq/g water-soluble titr. acid ≤0.005% S compounds	<0.001% water <0.005% water (100 mL pkg)	≤0.0003 meq/g water-soluble titr. acid ≤0.005% S compounds ≤0.001% free acid (as CH ₃ COOH) ≤0.02% water

HEXANE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
178918-4X4L	ACS reagent, ≥ 98.5%	glass bottle
178918-20L	ACS reagent, ≥ 98.5%	steel drum
227064-1L	anhydrous, 99%	Sure/Seal™
293253-4X4L	HPLC Plus grade, ≥ 98.5%	glass bottle

Synonym Hexanes, Isohexane

CAS Number	67-68-5
Linear Formula	C ₆ H ₁₄
Molecular Weight	86.18
Beilstein Registry Number	1730733
MDL Number	MFCD02179311
PubChem Substance ID (ACS)	24850778
PubChem Substance ID (anhydrous)	24853608
PubChem Substance ID (HPLC)	24857647

Hydrogen peroxide solution



HYDROGEN PEROXIDE SPECIFICATIONS

Vapor Pressure:	23.3 mmHg (30 °C)
Concentration:	50 wt. % in H ₂ O
MP:	-40 °C
Density:	1.197 g/mL at 20 °C
Storage Temp:	2-8°C

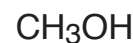
HYDROGEN PEROXIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
516813-500ML	50 wt. % in H ₂ O, stabilized	poly bottle
516813-4L	50 wt. % in H ₂ O, stabilized	poly bottle

For larger volumes or bulk orders, contact sales at Chrom Tech for pricing.

CAS Number	7722-84-1
Empirical Formula (Hill Notation)	H ₂ O ₂
Molecular Weight	34.01
Beilstein Registry Number	3587191
EC Number	231-765-0
MDL Number	MFCD00011333
PubChem Substance ID	24873899

Methanol



METHANOL SPECIFICATIONS

Grade:	ACS reagent	HPLC grade	Plus HPLC grade
Assay:	≥99.8%	≥99.9%	≥99.9%
Impurities:	H ₂ SO ₄ , passes test (darkened) MnO ₄ ⁻ reducers, passes test ≤0.0002 meq/g Titr. base ≤0.0003 meq/g Titr. acid ≤0.001% acetaldehyde ≤0.001% acetone ≤0.001% formaldehyde ≤0.1% water	≤0.0005% non-volatile matter ≤1 ppb fluorescence (quinine) at 254 nm ≤1 ppb fluorescence (quinine) at 365 nm <0.03% water (Karl Fischer)	≤0.0002 meq/g Titr. base ≤0.0003 meq/g Titr. acid ≤0.001% Carbonyl Compounds <0.05% water

METHANOL ORDERING INFORMATION

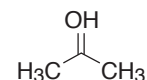
PART NO-PACK SIZE	GRADE	CONTAINER
179337-4X4L	ACS reagent, ≥ 99.8%	glass bottle
179337-20L	ACS reagent, ≥ 99.8%	steel drum
646377-4X4L	HPLC Plus grade, ≥ 99.9%*	glass bottle

*Preparation Note: Product filtered through a 0.2 μm filter

Synonym Methyl alcohol

CAS Number	67-56-1
Linear Formula	CH ₃ OH
Molecular Weight	32.04
Beilstein Registry Number	1098229
EC Number	200-659-6
MDL Number	MFCD00004595
PubChem Substance ID (ACS)	24850805
PubChem Substance ID (HPLC)	24861591 24883456

2-Propanol



2-PROPANOL SPECIFICATIONS

Grade:	ACS reagent	Anhydrous	HPLC grade
Assay:	≥99.5%	99.5%	99.9%
Impurities:	≤0.0001 meq/g Titr. acid or base ≤0.002% carbonyl compounds (as propionaldehyde or acetone) ≤0.2% water	<0.003% water <0.005% water (100 mL pkg)	≤0.0005% non-volatile matter ≤0.001% free acid (as C ₂ H ₅ COOH) ≤0.05% water (Karl Fischer)

2-PROPANOL ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
190764-4X4L	ACS reagent, ≥ 99.5%	glass bottle
190764-20L	ACS reagent, ≥ 99.5%	steel drum
278475-1L	anhydrous, 99.5%*	Sure/Seal™
278475-6X1L	anhydrous, 99.5%*	Sure/Seal™
34863-4X4L	HPLC grade, ≥ 99.9%	glass bottle

*Preparation Note: Product filtered through a 0.2 μm filter

Synonym sec-Propyl alcohol, IPA, Isopropanol, Isopropyl alcohol

CAS Number	67-63-0
Linear Formula	(CH ₃) ₂ CHOH
Molecular Weight	60.10
Beilstein Registry Number	635639
EC Number	00-661-7
MDL Number	MFCD00011674
PubChem Substance ID (ACS)	24851459
PubChem Substance ID (anhydrous)	24856817
PubChem Substance ID (HPLC)	24861595

Isopropanol is a polar organic solvent that is widely used in chemistry, biochemistry, and molecular biology. Industrial applications include its use in antifreezes, quick-drying oils, and quick-drying inks, and as a solvent for gums, shellac, and essential oils. Isopropanol has been utilized as a solvent in the synthesis of solid phase acylating agents.

Tetrahydrofuran



TETRAHYDROFURAN SPECIFICATIONS

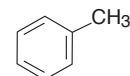
Grade:	ACS reagent, contains 250 ppm BHT as inhibitor	Anhydrous, inhibitor-free option or contains 250 ppm BHT as inhibitor	HPLC grade, inhibitor-free
Assay:	≥99.0%	≥99.9%	≥99.9%
Impurities:	≤0.015% peroxide (as H ₂ O ₂) ≤0.05% water	Inhibitor-free: ≤20 ppm peroxide (as H ₂ O ₂) <0.002% water <0.005% water(100 mL pkg) BHT as inhibitor: ≤0.005% peroxides (as H ₂ O ₂) <0.002% water <0.005% water(100 mL pkg)	≤0.0005% non-volatile matter ≤0.002% free acid (as CH ₃ COOH) ≤0.05% peroxides (as H ₂ O ₂) ≤0.05% water (Karl Fischer)

CAS Number	109-99-9
Linear Formula	C ₄ H ₈ O
Molecular Weight	72.11
Beilstein Registry Number	102391
EC Number	203-726-8
MDL Number	MFCD00005356
PubChem Substance ID (ACS)	24862173
PubChem Substance ID (anhydrous)	24864878 24851228
PubChem Substance ID (HPLC)	24861598

TETRAHYDROFURAN ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
360589-4X4L	ACS reagent, ≥ 99.0%	glass bottle
401757-1L	anhydrous, 99.9% inhibitor-free	Sure/Seal™
401757-6X1L	anhydrous, 99.9% inhibitor-free	Sure/Seal™
186562-1L	anhydrous, 99.9% BHT as inhibitor	Sure/Seal™
186562-6X1L	anhydrous, 99.9% BHT as inhibitor	Sure/Seal™
34865-4X4L	HPLC Plus grade, ≥ 99.9%	glass bottle

Toluene



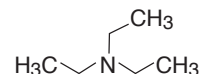
TOLUENE SPECIFICATIONS			
Grade:	ACS reagent	Anhydrous	HPLC grade
Assay:	≥99.5%	≥99.8%	≥99.5%
Impurities:	H ₂ SO ₄ , passes test (darkened) ≤0.003% S compounds ≤0.030% water	<0.001% water <0.005% water (100 mL pkg)	≤0.0005% non-volatile matter ≤0.0005% thiophene ≤0.001% free acid (as HCl) ≤0.02% water (Karl Fischer)

TOLUENE ORDERING INFORMATION		
PART NO-PACK SIZE	GRADE	CONTAINER
179418-4X4L	ACS reagent, ≥ 99.5%	glass bottle
179418-20L	ACS reagent, ≥ 99.5%	steel drum
244511-1L	anhydrous, 99.8%*	Sure/Seal™
244511-6X1L	anhydrous, 99.8%*	Sure/Seal™
34866-4X4L	HPLC grade, ≥ 99.9%	glass bottle

*Preparation Note: Product filtered through a 0.2 µm filter

CAS Number	108-88-3
Linear Formula	C ₆ H ₅ CH ₃
Molecular Weight	92.14
Beilstein Registry Number	635760
EC Number	203-625-9
MDL Number	MFCD00008512
PubChem Substance ID (ACS)	24850811
PubChem Substance ID (anhydrous)	24854682
PubChem Substance ID (HPLC)	24861599

Triethylamine



TRIETHYLAMINE SPECIFICATIONS	
Assay:	≥99%
Impurities:	≤0.5% water (Karl Fischer)

TRIETHYLAMINE ORDERING INFORMATION		
PART NO-PACK SIZE	GRADE	CONTAINER
T0886-100ML	≥99%	glass bottle
T0886-500ML	≥99%	glass bottle
T0886-1L	≥99%	glass bottle

Synonym	TEA
CAS Number	121-44-8
Linear Formula	(C ₂ H ₅) ₃ N
Molecular Weight	101.19
Beilstein Registry Number	605283
EC Number	204-469-4
MDL Number	MFCD00009051
PubChem Substance ID	24855218

Triethylamine is a mobile phase modifier in the reverse phase high pressure liquid chromatography (RP-HPLC) separation of drugs. It improves resolution of amino acids and amino acid amides by HPLC by suppressing tailing. It has also been used in gas chromatographic analysis of volatile fatty acids.

Water



WATER SPECIFICATIONS		
Grade:	HPLC grade	Plus HPLC grade
Impurities:		≤0.0003% non-volatile matter ≤1 ppb fluorescence (quinine) at 254 nm ≤1 ppb fluorescence (quinine) at 365 nm

WATER ORDERING INFORMATION		
PART NO-PACK SIZE	GRADE	CONTAINER
270733-4X4L	HPLC grade	glass bottle
34877-4X4L	Plus, HPLC grade*	glass bottle

Preparation Note: Product filtered through a 0.2 µm filter

*Limited shelf life, expiration date on the label

CAS Number	7732-18-5
Empirical Formula (Hill Notation)	H ₂ O
Molecular Weight	18.02
Beilstein Registry Number	2050024
EC Number	231-791-2
MDL Number	MFCD00011332
PubChem Substance ID (HPLC)	24856394 24861615

Millipore Sigma Redi-Dri™ Salts

A common issue for hygroscopic powders is they tend to clump and become difficult to break up. Millipore Sigma set out to find an innovative solution to address this issue. We have created a proprietary packaging system that prevents solids, such as inorganic salts, from absorbing moisture regardless of the number of times you open the bottle or how humid the environment may be. This unique packaging solution provides many benefits such as:

Reduced costs—Minimize the need to break up solids, thus reducing your labor costs and saving you valuable lab time

Safer to use—Reduce the risk of injury and contamination by eliminating the need to chip away at solids

Longer shelf life—Redi-Dri remains free-flowing even after repeated exposures to air

Less waste—No need to discard unusable material



Calcium chloride

CaCl₂

CALCIUM CHLORIDE SPECIFICATIONS

Grade:	Redi-Dri™ anhydrous, free-flowing
Assay:	≥97%

CALCIUM CHLORIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
746495-1KG	anhydrous, free-flowing, Redi-Dri™, ≥97%	poly bottle
746495-2.5KG	anhydrous, free-flowing, Redi-Dri™, ≥97%	poly bottle

CAS Number	10043-52-4
Linear Formula	CaCl ₂
Molecular Weight	110.98
EC Number	233-140-8
MDL Number	MFCD00010903

Cesium chloride

CsCl

CESIUM CHLORIDE SPECIFICATIONS

Grade:	ReagentPlus® Redi-Dri™ anhydrous, free-flowing
Assay:	99.9%

CESIUM CHLORIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
746487-1KG	anhydrous, free-flowing, Redi-Dri™, ReagentPlus®, 99.9%	poly bottle

CAS Number	7647-17-8
Linear Formula	CsCl
Molecular Weight	168.36
EC Number	231-600-2
MDL Number	MFCD00010955

Lithium bromide

LiBr

LITHIUM BROMIDE SPECIFICATIONS

Grade:	ReagentPlus® Redi-Dri™ anhydrous, free-flowing
Assay:	≥99.9%
MP:	550 °C(lit.)

LITHIUM BROMIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
746479-1KG	anhydrous, free-flowing, Redi-Dri™, ReagentPlus®, ≥99%	poly bottle

CAS Number	7550-35-8
Linear Formula	LiBr
Molecular Weight	86.85
EC Number	231-439-8
MDL Number	MFCD00011077

Lithium chloride



LITHIUM CHLORIDE SPECIFICATIONS

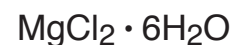
Grade	ACS reagent, Redi-Dri™ anhydrous, free-flowing
Assay	≥99%
Impurities	≤0.008 meq/g Titr. base, ≤0.01% insolubles

LITHIUM CHLORIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
746460-1KG	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle
746460-2.5KG	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle

CAS Number	7447-41-8
Linear Formula	LiCl
Molecular Weight	42.39
EC Number	231-212-3
MDL Number	MFCD00011078

Magnesium chloride hexahydrate



MAGNESIUM CHLORIDE HEXAHYDRATE SPECIFICATIONS

Grade	ACS reagent
Assay	99.0-102.0%
Impurities	≤0.005% Insoluble matter

MAGNESIUM CHLORIDE HEXAHYDRATE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
M9272-500G	ACS reagent, 99.0-102.0%	poly bottle

CAS Number	7791-18-6
Linear Formula	MgCl ₂ · 6H ₂ O
Molecular Weight	203.30
EC Number	232-094-6
MDL Number	MFCD00149781
PubChem Substance ID	24897325

Magnesium chloride is a widely used reagent in chemistry and molecular biology as a source of magnesium ion. Magnesium has a variety of biological roles in enzymology, cell membrane and wall structural integrity, muscle cell physiology, and nucleic acid structure. Magnesium is an essential co-factor in many enzymes, including deoxyribonuclease (DNase), the restriction enzymes EcoR I and EcoR V, and Ribonuclease H. Magnesium also stabilizes polymeric nucleic acids such as transfer RNA and ribozymes.

Magnesium sulfate



MAGNESIUM SULFATE SPECIFICATIONS

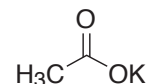
Grade:	ReagentPlus®, Redi-Dri™ anhydrous, free-flowing
Assay:	≥99.5%

MAGNESIUM SULFATE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
746452-1KG	anhydrous, free-flowing, Redi-Dri™, ReagentPlus®, ≥99.5%	poly bottle
746452-2.5KG	anhydrous, free-flowing, Redi-Dri™, ReagentPlus®, ≥99.5%	poly bottle

CAS Number	7487-88-9
Linear Formula	MgSO ₄
Molecular Weight	120.37
EC Number	231-298-2
MDL Number	MFCD00011110

Potassium acetate



POTASSIUM ACETATE SPECIFICATIONS

Grade	ACS reagent
Assay	≥99.0%
Impurities	≤0.005% insolubles

POTASSIUM ACETATE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
236497-500G	ACS reagent, ≥99.0%	poly bottle

CAS Number	127-08-2
Linear Formula	CH ₃ COOK
Molecular Weight	98.14
Beilstein Registry Number	3595449
EC Number	204-822-2
MDL Number	MFCD00012458
PubChem Substance ID	24854174

Potassium acetate is used as a buffer in molecular biology research, notably in the isolation of DNA. It is effective in the pH range 3.8 - 5.8. Potassium acetate may be utilized in the isolation of RNA intermediates and products from in vitro splicing reactions performed with a HeLa cell nuclear extract. Potassium acetate has been used to study the interactions between the TATA box binding protein from *Pyrococcus woesei* and an oligonucleotide with a specific binding site.

Potassium bromide

KBr

POTASSIUM BROMIDE SPECIFICATIONS

Grade	ACS reagent, Redi-Dri™ anhydrous, free-flowing
Assay	≥99%
Impurities	≤0.005% insolubles

POTASSIUM BROMIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
746444-1KG	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle

CAS Number	7758-02-3
Linear Formula	KBr
Molecular Weight	119.00
EC Number	231-830-3
MDL Number	MFCD00011358

Potassium carbonate

K₂CO₃

POTASSIUM CARBONATE SPECIFICATIONS

Grade	ACS reagent
Assay	≥99.0%
Impurities	≤0.004% S compounds as (SO ₄ ²⁻) ≤0.005% silica ≤0.01% insolubles

POTASSIUM CARBONATE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
209619-500G	ACS reagent, ≥99.0%	poly bottle
209619-2.5KG	ACS reagent, ≥99.0%	poly drum

CAS Number	584-08-7
Linear Formula	K ₂ CO ₃
Molecular Weight	138.21
Beilstein Registry Number	4267587
EC Number	209-529-3
MDL Number	MFCD00011382
PubChem Substance ID	24852581

Potassium chloride

KCl

POTASSIUM CHLORIDE SPECIFICATIONS

Grade	ACS reagent, Redi-Dri™ anhydrous, free-flowing
Assay	≥99%
Impurities	≤0.005% Insoluble matter

POTASSIUM CHLORIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
746436-1KG	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle
746436-2.5KG	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle

CAS Number	7447-40-7
Linear Formula	KCl
Molecular Weight	74.55
EC Number	231-211-8
MDL Number	MFCD00011360

Potassium iodide

KI

POTASSIUM IODIDE SPECIFICATIONS

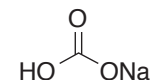
Grade	ACS reagent, Redi-Dri™ anhydrous, free-flowing
Assay	≥99%
Impurities	≤0.001% N compounds ≤0.005% insolubles

POTASSIUM IODIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
746428-1KG	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle
746428-2.5KG	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle

CAS Number	7681-11-0
Linear Formula	KI
Molecular Weight	166.00
EC Number	231-659-4
MDL Number	MFCD00011405

Sodium bicarbonate



SODIUM BICARBONATE SPECIFICATIONS

Grade	ACS reagent
Assay	≥99.7% 99.7-100.3%
Impurities	≤0.015% Insoluble matter

SODIUM BICARBONATE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
S6014-500G	ACS reagent, ≥99.7%	poly bottle
S6014-2.5KG	ACS reagent, ≥99.7%	poly bottle

CAS Number	144-55-8
Linear Formula	NaHCO ₃
Molecular Weight	84.01
Beilstein Registry Number	4153970
EC Number	205-633-8
MDL Number	MFCD00003528
PubChem Substance ID	24899682

Sodium bromide

NaBr

SODIUM BICARBONATE SPECIFICATIONS

Grade	ACS reagent, Redi-Dri™ anhydrous, free-flowing
Assay	≥99%

SODIUM BROMIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
746401-500G	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle
746401-6X500G	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle
746401-1KG	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle

CAS Number	7647-15-6
Linear Formula	NaBr
Molecular Weight	102.89
EC Number	231-599-9
MDL Number	MFCD00003475

Sodium bromide

SODIUM BICARBONATE SPECIFICATIONS

Grade	ACS reagent, Redi-Dri™ anhydrous, free-flowing
Assay	≥99%

SODIUM BROMIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
746401-500G	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle
746401-6X500G	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle
746401-1KG	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle

NaBr

CAS Number	7647-15-6
Linear Formula	NaBr
Molecular Weight	102.89
EC Number	231-599-9
MDL Number	MFCD00003475

Sodium chloride

SODIUM CHLORIDE SPECIFICATIONS

Grade	ACS reagent, Redi-Dri™ anhydrous, free-flowing
Assay	≥99%
Impurities	≤0.005% Insoluble matter

SODIUM CHLORIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
746398-1KG	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle
746398-2.5KG	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle

NaCl

CAS Number	7647-14-5
Linear Formula	NaCl
Molecular Weight	58.44
Beilstein Registry Number	3534976
EC Number	231-598-3
MDL Number	MFCD00003477

Millipore Sigma Redi-Dri™ Salts

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Reduced costs—Minimize the need to break up solids, thus reducing your labor costs and saving you valuable lab time

Safer to use—Reduce the risk of injury and contamination by eliminating the need to chip away at solids

Longer shelf life—Redi-Dri remains free-flowing even after repeated exposures to air

Less waste—No need to discard unusable material



Sodium iodide

SODIUM IODIDE SPECIFICATIONS	
Grade	ACS reagent, Redi-Dri™ anhydrous, free-flowing
Assay	≥99.5%
Impurities	≤0.002% N compounds ≤0.01% insolubles

SODIUM IODIDE ORDERING INFORMATION		
PART NO-PACK SIZE	GRADE	CONTAINER
746371-1KG	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle

NaI

CAS Number	7681-82-5
Linear Formula	NaI
Molecular Weight	149.89
EC Number	231-679-3
MDL Number	MFCD00003532

Sodium sulfate

SODIUM SULFATE SPECIFICATIONS		
Grade	ACS reagent, Redi-Dri™ anhydrous powder, free-flowing	ACS reagent, anhydrous powder
Assay	≥99%	>99.0%
Impurities	≤0.01% insolubles ≤5 ppm N compounds	≤0.01% insolubles ≤5 ppm N compounds

SODIUM SULFATE ORDERING INFORMATION		
PART NO-PACK SIZE	GRADE	CONTAINER
746363-1KG	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle
746363-2.5KG	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥99%	poly bottle
238597-500G	ACS reagent, ≥99.0%, anhydrous, powder	poly bottle

Na₂SO₄

CAS Number	7757-82-6
Linear Formula	Na ₂ SO ₄
Molecular Weight	142.04
EC Number	231-820-9
MDL Number	MFCD00003504
PubChem Substance ID (powder)	24854335

Zinc chloride

ZINC CHLORIDE SPECIFICATIONS	
Grade	ACS reagent, Redi-Dri™ anhydrous powder, free-flowing
Impurities	Oxychloride, passes test ≤0.005% insolubles

ZINC CHLORIDE ORDERING INFORMATION		
PART NO-PACK SIZE	GRADE	CONTAINER
746355-1KG	anhydrous, free-flowing, Redi-Dri™, ACS reagent, ≥97%	poly bottle

ZnCl₂

CAS Number	7646-85-7
Linear Formula	ZnCl ₂
Molecular Weight	136.30
EC Number	231-592-0
MDL Number	MFCD00011295

Ammonium hydroxide solution

NH₄OH

AMMONIUM HYDROXIDE SOLUTION SPECIFICATIONS

Grade	ACS reagent
Assay	28.0-30.0% NH ₃ basis
Impurities	MnO ₄ ⁻ reducers, passes test ≤0.002% CO ₂

AMMONIUM HYDROXIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
221228-500ML-A	ACS reagent, 28.0 – 30.0% NH ₃ basis	poly bottle
221228-2.5L-A	ACS reagent, 28.0 – 30.0% NH ₃ basis	poly bottle

Synonym Ammonia aqueous, Ammonia water

CAS Number	1336-21-6
Linear Formula	NH ₄ OH
Molecular Weight	35.05
Beilstein Registry Number	3587154
MDL Number	MFCD00066650
PubChem Substance ID	24853221

Ammonia is used as a fertilizer directly or in the manufacture of fertilizers, explosives and a huge range of materials. Ammonium hydroxide is widely used as a buffer (as ammonium acetate or as ammonium carbonate). These buffers are volatile and can be removed from protein solutions by lyophilization, leaving salt-free solids. As an ACS Reagent (American Chemical Society), this product meets the requirements. Ammonium hydroxide has a shelf-life of two years if stored at room temperature, but should be stored tightly sealed in a vented cabinet away from acids. Over time, the concentration may decrease due to evaporation of the gas from the solution. For critical applications, it may be advisable to store frequently opened containers at 2-8 °C.

Hydrochlorid acid

HCl

HYDROCHLORIC ACID SPECIFICATIONS

Grade	ACS reagent
Assay	36.5-38.0% (ACS specification) 37%
Impurities	≤1 ppm free chlorine ≤5 ppm extractable organic substances

HYDROCHLORIC ACID ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
258148-2.5L	ACS reagent, 37%	poly bottle
258148-4X4L	ACS reagent, 37%	poly bottle

Synonym hydrogen chloride solution, muriatic acid

CAS Number	7647-01-0
Empirical Formula (Hill Notation)	HCl
Molecular Weight	36.46
Beilstein Registry Number	1098214
EC Number	231-595-7
MDL Number	MFCD00011324
PubChem Substance ID	24855631

Hydrochloric acid is a clear colorless liquid which is a solution of hydrogen chloride gas dissolved in water. Reagent grade hydrochloric acid certified by the American Chemical Society (ACS) must assay between 36.5 and 38.0% HCl (titration) and meet ACS criteria regarding trace impurities. The product is stable at room temperature if kept sealed and away from bases and metals. Solubility of HCl gas decreases somewhat with increased temperature. The solution may develop a yellowish color with time due to traces of iron, chlorine or organic matter.

Nitric acid

HNO₃

NITRIC ACID SPECIFICATIONS

Grade	ACS reagent
Assay	68.0-70.0% (ACS specification) 70%

NITRIC ACID ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
438073-500ML	ACS reagent, 70%	glass bottle
438073-2.5L	ACS reagent, 70%	glass bottle

CAS Number	7697-37-2
Empirical Formula (Hill Notation)	HNO ₃
Molecular Weight	63.01
EC Number	231-714-2
MDL Number	MFCD00011349
PubChem Substance ID	24867421

Potassium hydroxide

KOH

POTASSIUM HYDROXIDE SOLUTION SPECIFICATIONS

Grade	ACS reagent
Assay	≥85%
Impurities	≤0.001% N compounds ≤2.0% K ₂ CO ₃ 10-15% water

POTASSIUM HYDROXIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
221473-500G	ACS reagent, ≥85%, pellets	poly bottle
221473-2.5KG	ACS reagent, ≥85%, pellets	poly bottle

Synonym Caustic potash

CAS Number	1310-58-3
Linear Formula	KOH
Molecular Weight	56.11
EC Number	215-181-3
MDL Number	MFCD00003553
PubChem Substance ID	24853244

Potassium hydroxide (KOH) is a caustic reagent that is widely used to neutralize acids and prepare potassium salts of reagents. It is used in a variety of large-scale applications, such as the manufacture of soap, the mercerizing of cotton, electroplating, photoengraving, and lithography.

Sodium hydroxide solution

NaOH

SODIUM HYDROXIDE SOLUTION SPECIFICATIONS

Concentration	50% in H ₂ O
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SODIUM HYDROXIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
415413-500ML	50% solution in H ₂ O	poly bottle
415413-1L	50% solution in H ₂ O	poly bottle

Synonym caustic soda, soda lye

CAS Number	1310-73-2
Linear Formula	NaOH
Molecular Weight	40.00
MDL Number	MFCD00003548
PubChem Substance ID	24866001

Sodium hydroxide (NaOH) is a caustic reagent that is widely used to neutralize acids and prepare sodium salts of reagents. It is also used in a variety of largescale applications, such as pulp and paper manufacturing, the manufacture of soap and detergents, and water treatment. Sodium hydroxide stock solutions should be stored in plastic containers. Glass containers should be completely avoided in the preparation and storage of sodium hydroxide solutions. For volumetric NaOH solutions, it is necessary to protect them from air to avoid formation of carbonate.

Sodium hydroxide

NaOH

SODIUM HYDROXIDE SOLUTION SPECIFICATIONS

Grade	ACS reagent
Assay	≥97.0%
Impurities	≤0.001% N compounds ≤0.02% NH ₄ OH ppt. ≤1.0% Na ₂ CO ₃

SODIUM HYDROXIDE ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
221465-500G	ACS reagent, ≥97.0%, pellets	poly bottle
221465-2.5KG	ACS reagent, ≥97.0%, pellets	poly bottle

Synonym caustic soda, soda lye

CAS Number	1310-73-2
Linear Formula	NaOH
Molecular Weight	40.00
EC Number	215-185-5
MDL Number	MFCD00003548
PubChem Substance ID	24853242

This product is in the form of pellets. It is designated as ACS Reagent grade and meets the specifications of the American Chemical Society (ACS) for reagent chemicals. Sodium hydroxide (NaOH) is a caustic reagent that is widely used to neutralize acids and prepare sodium salts of reagents. It is also used in a variety of largescale applications, such as pulp and paper manufacturing, the manufacture of soap and detergents, and water treatment. Sodium hydroxide stock solutions should be stored in plastic containers. Glass containers should be completely avoided in the preparation and storage of sodium hydroxide solutions. For volumetric NaOH solutions, it is necessary to protect them from air to avoid formation of carbonate.

Sulfuric acid**SULFURIC ACID SPECIFICATIONS**

Grade	ACS reagent
Assay	95.0 – 98.0%

SULFURIC ACID ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
258105-500ML	ACS reagent, 95.0 – 98.0%	poly bottle
258105-2.5L	ACS reagent, 95.0 – 98.0%	poly bottle

Synonym Oil of vitriol; dihydrogen sulfate; battery acid

CAS Number 7664-93-9

Linear Formula H_2SO_4

Molecular Weight 98.08

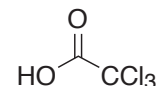
Beilstein Registry Number 2037554

EC Number 231-639-5

MDL Number MFCD00064589

PubChem Substance ID 24855628

Sulfuric acid has a very high affinity for water, and can be used as a drying agent for air and many organic materials. It will remove the elements of water from wood or sugar, charring them. Sulfuric acid is widely used commercially in the manufacture of fertilizers, metal treatments, car batteries, etc. It is the top-selling inorganic chemical in the United States, produced in excess of 90 billion pounds annually. As an ACS Reagent, this product meets or exceeds limits set for trace impurities, and assays between 95 and 98%, based on test methods described by the American Chemical Society.

**Trichloroacetic acid****HYDROCHLORIC ACID SPECIFICATIONS**

Grade	ACS reagent
Assay	≥99.0%
Impurities	Substances darkened by sulfuric acid, passes test ≤0.01% insoluble matter

TRICHLOROACETIC ACID ORDERING INFORMATION

PART NO-PACK SIZE	GRADE	CONTAINER
T6399-500G	ACS reagent, ≥99.0%	glass bottle
T6399-1KG	ACS reagent, ≥99.0%	glass bottle

Synonym TCA

CAS Number 76-03-9

Linear Formula Cl_3CCOOH

Molecular Weight 163.39

Beilstein Registry Number 970119

EC Number 200-927-2

MDL Number MFCD00004177

PubChem Substance ID 24900373

This product is designated as a ACS Reagent, meeting the specifications of the ACS for reagent chemicals. Trichloroacetic acid (TCA) is a reagent used for the precipitation of proteins and nucleic acids. TCA is also used as a decalcifier and fixative in microscopy.

Guide to GC Derivatization Methods/Functional Groups

FUNCTIONAL GROUP	SILYLATION	ACYLATION	ALKYLATION
Active Hydrogens	BSTFA, BSTFA/TMCS, Deriva-Sil, Hydrox-Sil, TBH, MSTFA, MtBSTFA, TMSI	PFPOH/PFPA	DMF Dialkylacetals
Carboxylic Acids	BSTFA, Hydrox-Sil Concentrate., MtBSTFA, TMSI	PFPOH/PFPA	BF3/Methanol, BF3/n-Butanol, DMF Dialkylacetals, TBH
Alcohols and Phenols: unhindered and moderately hindered	BSA, BSTFA/TMCS, HMDS, MtBSTFA/t-BDMCS	HFBI, Fluorinated anhydrides (HFBA, PFPA, TFAA), MBTFA, MCF*	DMF Dialkylacetals, PFB-Br/TBA-H-SO ₄ , TBH
Alcohols and Phenols: highly hindered	BSTFA/TMCS, Deriva-Sil, Deriva-Sil Concentrate	Fluorinated anhydrides (HFBA, PFPA, TFAA), HFBI, MBTFA, PFBCI	DMF Dialkylacetals, PFB-Br/TBA-H-SO ₄ , TBH
Amines: primary and secondary	BSTFA, MtBSTFA/t-BDMCS	Fluorinated anhydrides (HFBA, PFPA, TFAA), HFBI, MBTFA, PFBCI, TPC*	DMF Dialkylacetals, TBH
Amides	BSA, BSTFA, BSTFA/TMCS, Deriva-Sil Concentrate	HFBI	DMF Dialkylacetals
Amino Acids	BSTFA, TMSI	HFBI (+ Silylation)	DMF Dialkylacetals, TBH, 3N HCl in n-Butanol
Catecholamines	TMSI	Fluorinated anhydrides (HFBA, PFPA, TFAA), HFBI	
Carbohydrates and Sugars	HMDS, Hydrox-Sil AQ, TMSI	MBTFA	
Inorganic Anions	BSTFA, MtBSTFA		
Nitrosamines		HFBI	
Sulfonamides	BSTFA	Fluorinated anhydrides (HFBA, PFPA, TFAA)	DMF Dialkylacetals, PFB-Br/TBA-H-SO ₄

Derivatization reagents are listed in alphabetical order, not in order of preference.

*For Chiral Analysis

Source: Knapp, D.R. Handbook of Analytical Derivatization Reactions; John Wiley and Sons: New York, 1979.



Regis Silylation Reagents**BSA**

N,O-Bis(trimethylsilyl)acetamide

BSA	
PART NO	PACK SIZE
270501	10 x 1 g
270502	4 x 5 g
270503	25 g
270504	100 g

- Forms highly stable TMS derivatives with most organic functional groups under mild reaction conditions
- Recommended storage temp: 2 – 8 °C

BSTFA-Regisil®, BSTFA + TMCS (1%, 10%)

N,O-Bis(trimethylsilyl trifluoroacetamide

BSTFA-REGISIL®, BSTFA + TMCS (1%, 10%)	
PART NO	PACK SIZE
REGISIL® RC-1 BSTFA	
270111	10 x 1 g
270112	4 x 5 g
270113	25 g
270114	100 g
REGISIL® RC-2 BSTFA +1% TMCS	
270121	10 x 1 g
270122	4 x 5 g
270123	25 g
270124	100 g
REGISIL® RC-3 BSTFA + 10% TMCS	
270131	10 x 1 g
270132	4 x 5 g
270133	25 g
270134	100 g

- Reacts faster and more completely than BSA due to presence of trifluoroacetyl group
- The high volatility of BSTFA and its byproducts result in separation of early eluting peaks
- Highly volatile and stable products result in low detector noise and fouling
- Excellent solubility
- Addition of TMCS catalyzes reactions of hindered functional groups in secondary alcohols and amines

HMDS

Hexamethyldisilazane

HMDS	
PART NO	PACK SIZE
270651	25 g
270652	100 g

- Weak TMS donor, used for silylation of carbohydrates
- Used as mixture with pyridine and trifluoroacetic acid

Regis Silylation Reagents (cont.)

MSTFA

N-Methyltrimethylsilyltrifluoroacetamide

MSTFA	
PART NO	PACK SIZE
MSTFA	
270590	10 x 1 g
270589	10 g
270593	25 g
270594	100 g
MSTFA +1% TMCS	
270690	10 x 1 g
270691	10 g
270693	25 g
270694	100 g

- Most volatile of the TMS-acetamides
- Useful in the analysis of volatile trace materials

TMCS

Trimethylchlorosilane

TMCS	
PART NO	PACK SIZE
270601	25 g
270602	100 g

- Used as a catalyst to increase reactivity of other silylation reagents

MtBSTFA + 1% t -BDMCS

N-Methyl-N-(t-butylidimethylsilyl trifluoroacetamide

MTBSTFAMTBSTFA + 1% T -BDMCS	
PART NO	PACK SIZE
MTBSTFA + 1% T-BDMCS	
270141	5 x 1 g
270144	10 x 1 g
270142	2 x 5 g
270143	25 g
MTBSTFA (NO T-BDMCS)	
270241	5 x 1 g
270242	2 x 5 g
270243	25 g

- Replaces active hydrogens to form t-BDMS derivatives
- Derivatization is usually complete upon dissolution with this exceptionally strong, yet mild silylating reagent
- MtBSTFA derivatives are 104 times more stable to hydrolysis than their corresponding TMS derivatives
- Produces easily interpreted mass spectra for GC/MS
- Addition of t-BDMCS catalyzes reactions of hindered alcohols and amines

TMSI

Trimethylsilylimidazole

TMSI	
PART NO	PACK SIZE
270401	10 x 1 g
270402	5 g
270403	25 g

- Potent, selective TMS donor that reacts with alcohols and phenols but not amines or amides
- Used in the preparation of dual perfluoroacyl and TMS derivatives
- Recommended storage temp: 2 – 8 °C

Regis Derivatization Grade Solvents

DERIVATIZATION GRADE SOLVENTS	
PART NO	PACK SIZE
ACETONITRILE	
270010	2 x 25 mL
PYRIDINE	
270013	2 x 25 mL

Derivatization Grade Solvents

- High purity reagents packaged under nitrogen
- Sealed with PTFE-coated septa allowing easy access to sample without exposure to moisture and oxygen

Regis Acylation Reagents

Fluorinated Anhydrides: HFBA/PFPA/TFAA

Heptafluorobutyric Anhydride/ Pentafluoropropionic Anhydride/Trifluoroacetic Anhydride

FLUORINATED ANHYDRIDES: HFBA/PFPA/TFAA	
PART NO	PACK SIZE
HFBA	
270851	10 x 1 g
270853	25 g
PFPA	
640110	10 x 1 g
640113	25 g
640114	100 g
TFAA	
270841	10 x 1 g
270843	25 g

- Most commonly used for ECD
- Reacts with alcohols, amines, and phenols
- Bases such as triethylamine and trimethylamine can be added to promote reactivity
- Frequently used for the confirmation of drugs of abuse
- HFBA derivatives are the most sensitive to ECD
- PFPA derivatives require the lowest analysis temperatures
- TFAA is the most reactive and volatile of the anhydrides

HFBI

Heptafluorobutyrylimidazole

HFBI	
PART NO	PACK SIZE
270611	5 x 1 g
270612	5 g
270613	25 g

- Readily forms derivatives with phenols, alcohols and amines suitable for ECD
- Reactions are fast and mild
- Imidazole is not acidic, so no decomposition or corrosion occurs on columns
- Recommended storage temp: 2 – 8 °C

MBTFA

N-Methyl-N-bis(trifluoroacetamide)

MBTFA	
PART NO	PACK SIZE
270091	5 g
270092	10 x 1 g
270095	25 g
270093	100 g

- Reacts rapidly under mild conditions with primary and secondary amines
- Reacts more slowly with alcohols, phenols, and thiols
- Works well in the analysis of sugars

Regis Acylation Reagents (cont.)

PFPOH

2,2,3,3,3-Pentafluoropropanol

PFPOH	
PART NO	PACK SIZE
270815	5 g
270816	25 g

- Used in combination with PFPA to make derivatives of the most common functional groups, especially polyfunctional bio-organic compounds
- Formed derivatives are highly suitable for ECD

TPC

N-Trifluoroacetyl-L-Prolyl Chloride

TPC	
PART NO	PACK SIZE
440002	5 mL
440001	25 mL

- Couples with amines to form diastereomers which can be separated on GC columns
- Provides sample volatility
- Used for confirmation of drugs of abuse testing
- Recommended storage temp: 2 – 8 °C

MCF

(1R, 2S, 5R)-(-)-Menthylchloroformate

MCF	
PART NO	PACK SIZE
440003	25 mL

- Resolves enantioenriched alcohols.
- Recommended storage temp: 2 – 8 °C

HFIP

1,1,1,3,3,3-Hexafluoro-2-Propanol

HFIP	
PART NO	PACK SIZE
270701	10 g
270702	25 g
270704	100 g

- Esterification reagent for the determination of aromatic acids in tissue by GC and electron capture detection

(R)-(-)-MTPA-Cl

Mosher's acid chloride (R)-(-)- α - (trifluoromethyl) phenylacetyl chloride

(R)-(-)-MTPA-Cl	
PART NO	PACK SIZE
270900	100 g
270901	500 g

- (R)-(-)-MTPA-Cl is a ready to use reagent for the determination of enantiomeric purity of alcohols and amines
- Recommended storage temp: 2 – 8 °C

Regis Alkylation Reagents

3.0 N HCl in n-Butanol

3.0 N HCl IN N-BUTANOL	
PART NO	PACK SIZE
201007	4 x 25 mL
201009	100 mL
201010	500 mL

- Most commonly used for rapid diagnosis of neonatal blood spots by Tandem Mass Spectrometry
- Recommended storage temp: 2 – 8 °C

3N HCl in n-Butanol is a derivatization reagent required for newborn screening for metabolic disorders. Neonatal screening, which has become a standard procedure in many countries, measures amino acids and acylcarnitines from a single drop of blood. Blood concentration of one or several of these compounds is either abnormally high or low in a variety of metabolic disorders in newborns. Derivatization with 3N HCl in n-Butanol ensures butylation of the carboxyl acid group of the analyte and formation of butyl ester, which forces ionization or makes charging of the analytes more efficient. Although direct analysis of extracted acycarnitine without derivatization is possible, according to different reports, butylesterification is superior with regard to sensitivity and specificity. Methods that include derivatization with 3N HCl in n-Butanol is the only validated procedure at this time.

Many factors contribute to the success of a newborn screening process. Any impurities in derivatization reagent can potentially interfere with the analysis. 3N HCl in n-Butanol from Regis Technologies is manufactured under cGMP protocols to assure highest quality and lot-to lot consistency for this reagent. Each lot is tested by tandem mass spectrometry to ensure absence of contaminants which may interfere with analysis. Our Quality Assurance department reviews and approves all production documentation and test results. Regis takes necessary precautions that assure the quality of our 3N HCl in n-Butanol.

BF3 in Methanol

BF3 IN METHANOL	
PART NO	PACK SIZE
270260	100 mL
270263	500 mL
270265	5 x 8 mL

- BF3 in Methanol is an Alkylation Reagent for GC Derivatization and is the most commonly used method of forming methyl esters of organic acids
- Recommended storage temp: 2 – 8 °C

Regis Ion Pair Reagents & Buffers

Purity is a Key Ingredient

Purity is of key importance in the manufacturing of our Ion Pair Reagents. Regis S- and Q-Series products are synthesized in accordance with the industry's highest quality standards, resulting in exceptional purity and integrity. This is demonstrated in table 1. UV transparency as low as 200 nm can be achieved for both the S- and Q-Series reagents. In most cases, these absorbances are lower than those for HPLC grade acetonitrile and methanol. Although the S- and Q-Series ion pair reagents can be used at wavelengths less than 210 nm, the crucial factors in determining what wavelength to use are the integrity of the detector optics and the purity of the organic modifiers.

Regis also supplies bulk Sulfonate and several additional bulk Ion Pair Reagents to complement the separation capabilities of the Sulfonate S-Series and Quaternary Amine Q-Series.

How to Select a Regis Ion Pair Reagent for Method Development

To choose the proper reagent, alkyl chain lengths must be taken into consideration. The chain lengths enable selective separation of the analyte. The longer the chain, the more hydrophobic the counterion, and therefore, greater the retention. Retention may increase by a factor of almost 20 when going from pentyl (Q5) to dodecyl (Q12), as illustrated in table 2. Table 2 also demonstrates that the Q-reagent chain length governs benzoic acid retention times, but does not affect the benzyl alcohol retention times. Similar behavior can also be achieved with the S-Series. The following are guidelines to developing a successful method using Regis' ion pair reagents:

- ➔ Select a column—endcapped ODS (octadecylsilyl) is most common
- ➔ Use only HPLC-grade water and chromatography grade reagents in mobile phase preparation
- ➔ Choose the mobile phase components and concentrations that give the best separation
- ➔ If nonionic components are present in the sample, optimize the resolution prior to attempting ionic separations
- ➔ Select the appropriate ion pair series to provide the necessary counterion. Use the Q-series for acidic compounds and the S-series for basic compounds
- ➔ Through a process of elimination, choose the alkyl chain length which results in the best separation
- ➔ Once the reagent has been selected, adjust the pH of the mobile phase to maximize resolution. Because slight modification of pH can profoundly effect retention and selectivity, make all adjustments in small increments and monitor carefully (table 3)
- ➔ Ideally, the ion pair reagent concentration in the mobile phase should be 0.005 M. However, small adjustments in reagent concentration may increase retention slightly and optimize the separation

OPTICAL ABSORBANCE (AUFS)		
S-SERIES	200 nm	210 nm
S5	0.006	0.002
S6	0.048	0.018
S7	0.008	0.001
S8	0.001	0.003
CH3CN	0.076	0.013
CH3OH	0.940	0.510

OPTICAL ABSORBANCE (AUFS)		
Q-SERIES	200 nm	210 nm
Q5	0.006	0.002
Q6	0.048	0.018
Q7	0.008	0.001
Q8	0.001	0.003
Q12	0.002	0.003

Table 1. Typical optical absorbances (AUFS) at 0.005 M.

Q-SERIES	RETENTION TIMES (MIN)		RETENTION RATIO
	BENZOIC ACID	BENZYL ALCOHOL	ACID/ALCOHOL
Q5	4.53	9.17	0.49
Q6	6.50	8.60	0.76
Q7	8.24	9.13	0.90
Q8	12.36	8.94	1.38
Q12	79.53	8.52	9.33

Table 2. Retention vs. chain length.

[BENZOIC ACID/BENZYL ALCOHOL IN (60/40) WATER/ METHANOL]						
pH	Q-6		Q7		Q8	
	R		R		R	
7.50	0.59		0.88		7.51	1.06
6.50	0.70		1.00		6.54	1.29
5.50	0.96		1.23		5.50	1.59

Table 3. Retention ratio R as a function of pH.

Regis Sulfonates (S-Series) For Basic Compounds

S-Series Ion Pair Concentrates (For Cations)

REGIS SULFONATES S-SERIES ION PAIR CONCENTRATES		
PRODUCT	(5) 10 mL BOTTLES	100 mL BOTTLE
S5 (pentylsodiumsulfonate)	405025	405035
S6 (hexylsodiumsulfonate)	405026	405036
S7 (heptylsodiumsulfonate)	405027	405037
S8 (octylsodiumsulfonate)	405028	405038
PRODUCT	PART NO	
0.5 M solutions of Alkyl Sulfonates (Each 10 mL bottle, diluted to 1 L, produces a 0.005 M solution)		
S-Series Method Development Kit Each kit contains a 10 mL bottle of each of the following: S5, S6, S7, S8	405020	

The sulfonates are sodium salts that act as an anionic counterion for the separation and resolution of positively charged analytes. The sulfonates are available as: Ion pair concentrates—premixed 0.5 M solutions of alkyl sulfonates. When diluted to 1 L with HPLC-grade water, a 10 mL bottle forms a 0.005 M solution.

Larger quantities are available upon request. Please call Chrom Tech for pricing.

Bulk Ion Pair Reagents (For Cations)

REGIS BULK ION PAIR REAGENTS		
PRODUCT	25 g	100 g
Pentanesulfonate, Sodium Salt	403025	403125
Hexanesulfonate, Sodium Salt	403026	403126
Heptanesulfonate, Sodium Salt	403027	403127
Octanesulfonate, Sodium Salt	403028	403128

Bulk powder—fine, purified crystals, for use as a buffer in large-scale mobile phase preparation.

Larger quantities are available upon request. Please call Chrom Tech for pricing.

Regis Quaternary Amines (Q-Series) For Acidic Compounds

Q-Series Ion Pair Concentrates (For Anions)

REGIS SULFONATES S-SERIES ION PAIR CONCENTRATES		
PRODUCT	(5) 10 mL BOTTLES	100 mL BOTTLE
Q5 (pentyltriethyl-ammonium phosphate)	404025	404035
Q6 (hexyltriethyl-ammonium phosphate)	404026	404036
Q7 (heptyltriethyl-ammonium phosphate)	404027	404037
Q8 (octyltriethyl-ammonium phosphate)	404028	404038
Q12 (dodecyltriethyl- ammonium phosphate)	404021	404031
PRODUCT	PART NO	
0.5 M solutions of Quaternary Alkyltriethylamines (Each 10 mL bottle, diluted to 1 L, produces a 0.005 M solution)		
S-Series Method Development Kit Each kit contains a 10 mL bottle of each of the following: Q5, Q6, Q7, Q8, Q12	404020	

The Q-series is comprised of quaternary alkyltriethylamines that can be used for the resolution of negatively charged species. This unique set of cationic reagents was developed to complement the Sulfonate Series (S-Series) and is exclusively manufactured by Regis.

The Quaternary Alkyltriethylamines are available as: Ion pair concentrates—premixed 0.5 M solutions of alkylamines. When diluted to 1 L with HPLC-grade water, a 10 mL bottle forms a 0.005 M buffered solution.

Other Regis Bulk Ion Pair Reagents (For Anions)

REGIS BULK ION PAIR REAGENTS		
PRODUCT	QTY	PART NO
Tetrabutyl ammonium, phosphate 0.5 M, pH 7.5	10 mL	680502
Tetrabutyl ammonium, phosphate 0.5 M, pH 7.5	50 mL	680505
Tetrabutyl ammonium, phosphate 0.5 M, pH 7.5	500 mL	680503
Tetrabutyl ammonium, phosphate 0.5 M, pH 7.5	1 L	680504

Other bulk Ion Pair reagents such as Tetrabutylammonium phosphate, Trihexylamine and Triheptylamine are complementary reagents used for the resolution of negatively charged analytes.

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222-1111LTM	184	238MS5.305	144	25005-252130	142	25102-102130	143	25302-152130	143
222-1131LTM	184	238MS5.310	144	25005-253030	142	25102-152130	143	25302-202130	143
222-1334LTM	191	238MS5.315	144	25005-254030	142	25102-202130	143	25303-011001	143
222-1534LTM	192	238MS5.325	144	25005-254630	142	25103-011001	143	25303-012101	143
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222-2932LTM	161	238MS5.510	144	250-1040ACN	360	25103-013001	143	25303-014001	143
222-3212LTM	183	238MS5.515	144	250-1045	360	25103-014001	143	25303-032130	143
222-3232LTM	183	238MS5.525	144	250-1045ACN	360	25103-032130	143	25303-033030	143
222-3812LTM	159	238MS51	144	250-1060	360	25103-034630	143	25303-052130	143
222-3832LTM	159	238MS52	144	250-1060ACN	360	25103-052130	143	25303-053030	143
222-4712LTM	160	238MS54	144	250-1065	360	25103-102130	143	25303-054030	143
222-4732LTM	160	238TP3410	145	250-1065ACN	360	25103-103030	143	25303-054630	143
222-5512LTM	155	238TP51	145	250-1070	360	25103-151030	143	25303-101030	143
222-5532LTM	155	238TP510	145	250-1070ACN	360	25103-152130	143	25303-102130	143
222-5711LTM	184	238TP5105	145	250-1130	351	25103-153030	143	25303-103030	143
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22-36-00485	353	238TP54	145	250-1210ACN	359	25105-103030	143	25303-154630	143
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