OPTIMIZE THE PERFORMANCE OF YOUR WATERS ALLIANCE HPLC SYSTEMS WITH AGILENT COLUMNS AND SUPPLIES

Agilent CrossLab

From Insight to Outcome

Agilent Technologies

A GROWING AGILENT PORTFOLIO THAT WORKS SEAMLESSLY WITH WATERS ALLIANCE HPLC SYSTEMS

Now you can increase your productivity and simplify your ordering process with Agilent supplies for your Waters Alliance HPLC Systems. This Agilent portfolio contains a wide range of high-quality supplies designed to fit seamlessly into your Waters instruments and workflow.

With the convenience of consolidated purchasing comes the assurance of knowing that our supplies for Waters Alliance are manufactured with the same commitment to quality that Agilent brings to everything we make. You benefit from over 40 years of Agilent chromatography expertise and innovation. What's more, you will also profit from the optimal performance of Agilent supplies, whether you're doing routine work or tackling the most challenging of applications.

We continuously add new products critical to instrument performance and productivity, and so you are almost certain to find exactly what you need. Every product is packaged so that it's easy to store and easy to find. And, thanks to Agilent's global delivery infrastructure, you can count on getting you the parts you need, when you need them.

Agilent CrossLab

From Insight to Outcome

Insights to Outcomes with Agilent CrossLab

Built on decades of Agilent leadership and innovation, Agilent CrossLab is a comprehensive, coordinated method of providing services, consumables, and software to dramatically improve laboratory efficiency and productivity. Agilent CrossLab connects you to a global team of scientific and technical experts who deliver vital, actionable insights at every level of the lab environment. Insights that maximize performance, reduce costs, and ultimately drive improved economic, operational, and scientific outcomes. Only Agilent CrossLab offers the unique combination of innovative products and comprehensive solutions that generate immediate results and lasting impact. Across your lab, around the world, every step of the way.

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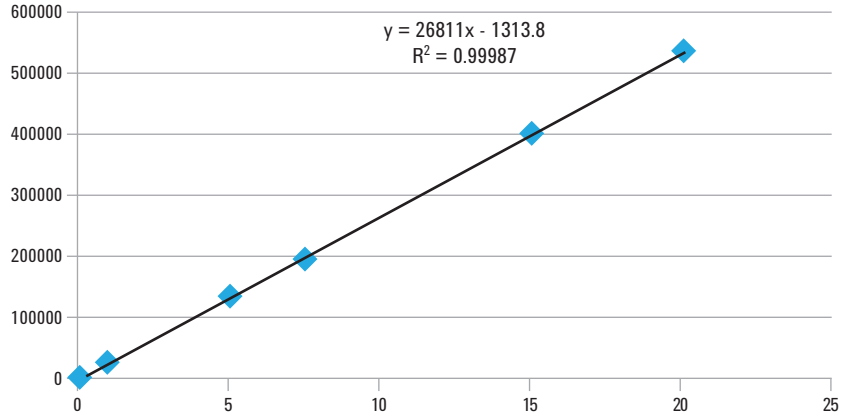
Agilent parts work perfectly on Waters systems

To demonstrate the performance of Agilent supplies, we analyzed acetaminophen (paracetamol) on a Waters Alliance HPLC System equipped with Agilent preventative maintenance kits for the pump and autosampler, and an Agilent UV detector lamp. A Captiva syringe filter was used during sample preparation, and a Poroshell 120 EC-C18 column for the separation.

The results showed expected linearity, precision, and sample recovery values, indicating that Agilent column and syringe filter delivers reproducible and precise pharmaceutical analysis, and Agilent instrument parts for Alliance system provide excellent alternatives to Waters genuine parts.



Linear response of peak area against concentration of acetaminophen.

Accuracy, intra-, and inter-batch precision of acetaminophen analysis. The accuracy for both concentrations and all batches was well within very low error range, below ±2%. The intra- and inter-batch RSD values were all below 0.7%, indicating significant precision.

Concentration (µg/mL)	Batch No.	Calculated concentration (µg/mL)	Accuracy (as % error)	Intra-batch RSD (%)	Inter-batch RSD (%)
0.5	1	0.51	1.08	0.23	0.58
	2	0.51	1.41	0.42	
	3	0.50	0.24	0.19	
15	1	15.06	0.41	0.15	0.62
	2	14.85	-1.02	0.11	
	3	14.93	-0.48	0.07	

Read the full details of this analysis in Agilent publication 5991-6017EN.

AGILENT SUPPLIES FOR WATERS LC SYSTEMS

Detector Lamps

Our detector lamps are designed for precise alignment and thermal stability

Agilent lamps are designed and built to be compatible with a wide variety of detectors, including variable wavelength detectors (VWD), multiple wavelength detectors (MWD), and diode array detectors (DAD) or photodiode array detectors (PDA). Each lamp adheres to the tightest specifications for consistent quality and reproducible performance over the lifetime of the lamp. Test equipment is regularly calibrated using optical standards certified by NIST (National Institute of Standards and Technology) or PTB (Physikalisch-Technische Bundesanstalt).

- Manufactured in an ISO 9001 certified environment
- Quartz glass bulbs for extended lifetime
- Individually tested for light intensity, noise and drift, correct operating voltage, and proper alignment for low lamp-to-lamp variability
- Tight QA/QC with traceability for every lamp throughout every step of the product process
- Both deuterium lamps and tungsten lamps available

Deuterium lamps

- High output stability and intensity for extended detection capabilities and improved qualification at trace level
- Guaranteed lifetime of 2,000 hours

Tungsten lamps

- Offer coverage in the visible wavelength range for high sensitivity detection
- Average lifetime range from 1,200 to 5,000 hours depending on operation conditions such as operation cycles, soft start, and operation voltage

TIPS & TOOLS

Each time you replace a detector lamp, perform wavelength calibration and intensity tests after warm up.

Detector Lamps, 1/pk

Model	Description	Similar to Waters Part No.	Part No.
2996 Photodiode Array Detector 996 Photodiode Array Detector	Long-life deuterium lamp, 2,000 hours	WAT052586	8005-0705
2487 Dual Wavelength Absorbance Detector 2488 Multichannel Absorbance Detector	Long-life deuterium lamp, 2,000 hours	WAS081142	8005-0704
486 Tunable UV/Visible Absorbance Detector LC Module 1	Long-life deuterium lamp, 2,000 hours	700000356 WAT052666	8005-0702

The cross references to the Waters part numbers listed here serve as a recommendation that the Agilent products are viable alternatives to Waters products. Agilent products are compatible with the corresponding Waters instruments, although in some cases, the Agilent products may have slightly different designs as compared to the Waters counterparts. All Agilent supplies are backed by the Agilent 90-day money-back warranty.

Long-life deuterium lamp, 8005-0705

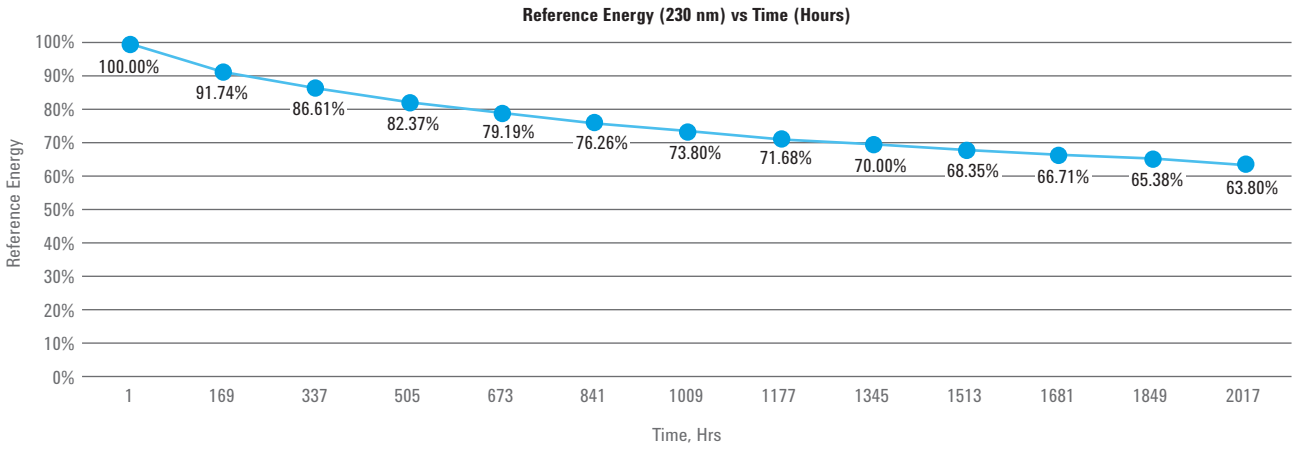
Long-life deuterium lamp, 8005-0704

Long-life deuterium lamp, 8005-0702

Updated UV Lamp for Alliance Detectors

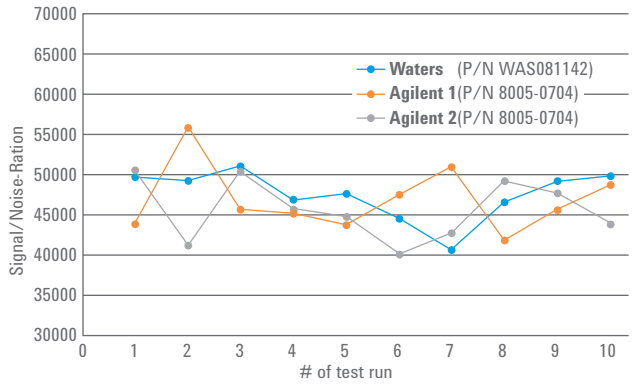
- Precise alignment to fit optical detector configuration to maximize intensity and signal to noise ratio
- Guaranteed long lifetime to lower the cost of ownership
- Certified and traceable production process
- Automated manufacturing process for minimal variations between lamps
- Uniform thickness and highest-quality material of lamp glass for consistent light spectra
- Rigorous testing on original instruments
- Double-insulated cable to meet stringent safety regulations
- Sturdy cap design for better usability

Lifetime: reference energy for the 8005-0704 well above 50% of the initial energy after 2,000 hours



The Agilent-specific cathode coating process leads to less intensity drop over time, and extends lamp lifetime by more than 50%. All Agilent long-life deuterium lamps are guaranteed to have a lifetime greater than 2,000 hours.

Average signal to noise values over ten injections on new lamps are comparable to the Waters lamps



As easy as closing a lever: The proprietary Agilent design features a spring-loaded mechanism for zero dead volume and a sure, tight connection.

Agilent A-Line Quick Connect Fittings

The fast, easy way to more predictable results

Poorly connected flow path fittings are one of the top reasons for peak tailing, peak broadening, split peaks, and carryover. That's because dead volume or micro-leakage can cause extra-column volume, which hinders the performance and reproducibility of HPLC and UHPLC.

Conventional fittings are non-adjustable, require specialized wrenches to install, and are incompatible with different column brands. They are also subject to over-tightening, which can cause the fitting to get stuck in the column.

Other manufacturers offer finger-tight fittings; however, these fittings usually have polymeric ferrules that lack grip strength at high pressures. As a result, you must constantly check for leaks and re-tighten the fittings to avoid tubing slippage and dead volume.

Save time, reduce cost, and minimize troubleshooting with A-Line Quick Connect fittings

With a Quick Connect fitting, you can be sure you're getting a perfect column connection, every time.

- **Truly finger-tight connection:** No special training is needed, so differences in user style will not affect your chromatography
- **Spring-loaded design** pushes the tubing against the receiving port for zero-dead-volume connections
- **Compatibility with all types of columns** by simply adjusting the ferrule
- **Reusable for more than 200 reconnections:** Quick Connect fittings are long lasting, reseal tightly, and are stable up to 1,300 bar (18,850 psi)
- **Fast, easy connections** that save you time and trouble—particularly during method development and column testing

"Now everyone in the lab gets an easy, accurate column connection."

PHARMACEUTICAL COMPANY

TIPS & TOOLS

In a tight spot?
Try an A-Line Quick Turn fitting

For instrument connections that are too tight for 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.*

A-Line Quick Turn Parts

Description	Part No.
Fittings and Ferrules	
Quick Turn LC fitting	5067-5966
Front ferrule	5043-0924
Capillaries	
Stainless steel, 0.075 x 105 mm long socket	5500-1198
Stainless steel, 0.075 x 150 mm long socket	5500-1232
Stainless steel, 0.12 x 105 mm long socket	5500-1188
Stainless steel, 0.12 x 150 mm long socket	5500-1189
Stainless steel, 0.12 x 180 mm long socket	5500-1233
Stainless steel, 0.12 x 200 mm long socket	5500-1190
Stainless steel, 0.12 x 280 mm long socket	5500-1191
Stainless steel, 0.12 x 500 mm long socket	5500-1192
Stainless steel, 0.17 x 105 mm long socket	5500-1193
Stainless steel, 0.17 x 150 mm long socket	5500-1194
Stainless steel, 0.17 x 180 mm long socket	5500-1234
Stainless steel, 0.17 x 200 mm long socket	5500-1195
Stainless steel, 0.17 x 280 mm long socket	5500-1196
Stainless steel, 0.17 x 380 mm long socket	5500-1235
Stainless steel, 0.17 x 400 mm long socket	5500-1236
Stainless steel, 0.17 x 500 mm long socket	5500-1197
Stainless steel, 0.17 x 700 mm long socket	5500-1237
NEW Stainless steel, 0.25 mm x 105 mm long socket with a female connection	5500-1261
NEW Stainless steel, 0.25 mm x 150 mm long socket	5500-1262
NEW Stainless steel, 0.25 mm x 400 mm long socket	5500-1263

Note: A-Line Quick Turn fittings require the capillaries specified in this table. 0.25 mm id solutions are optimized for Waters Alliance.

A-Line Quick Connect Fittings

Description	Part No.
Assemblies	
Stainless steel, 0.075 x 105 mm	5067-5961
Stainless steel, 0.075 x 150 mm	5067-6163
Stainless steel, 0.075 x 220 mm	5067-6164
Stainless steel, 0.075 x 280 mm	5067-6165
Stainless steel, 0.12 x 105 mm	5067-5957
Stainless steel, 0.12 x 150 mm	5067-5958
Stainless steel, 0.12 x 220 mm	5067-5959
Stainless steel, 0.12 x 280 mm	5067-5960
Stainless steel, 0.17 x 105 mm	5067-6166
Stainless steel, 0.17 x 150 mm	5067-6167
Stainless steel, 0.17 x 220 mm	5067-6168
Stainless steel, 0.17 x 280 mm	5067-6169
NEW Stainless steel, 0.25 mm x 105 mm, with a female connection	5067-6210

Note: Each assembly is equipped with a Quick Connect fitting, a capillary and a Swagelok fitting or with a female connection where specified. 0.25 mm id solutions are optimized for Waters Alliance.

Fittings and Ferrules	
Quick Connect LC fitting	5067-5965
Front ferrule	5043-0924
Capillaries	
Stainless steel, 0.075 x 105 mm	5500-1174
Stainless steel, 0.075 x 150 mm	5500-1175
Stainless steel, 0.075 x 220 mm	5500-1176
Stainless steel, 0.075 x 250 mm	5500-1177
Stainless steel, 0.075 x 280 mm	5500-1178
Stainless steel, 0.12 x 105 mm	5500-1173
Stainless steel, 0.12 x 150 mm	5500-1172
Stainless steel, 0.12 x 220 mm	5500-1171
Stainless steel, 0.12 x 280 mm	5500-1170
Stainless steel, 0.12 x 400 mm	5500-1179
Stainless steel, 0.12 x 500 mm	5500-1180
Stainless steel, 0.17 x 105 mm	5500-1181
Stainless steel, 0.17 x 150 mm	5500-1182
Stainless steel, 0.17 x 220 mm	5500-1183
Stainless steel, 0.17 x 280 mm	5500-1230
Stainless steel, 0.17 x 500 mm	5500-1231
NEW Stainless steel, 0.25 mm x 105 mm, with a female connection	5500-1258
NEW Stainless steel, 0.25 mm x 150 mm	5500-1259
NEW Stainless steel, 0.25 mm x 400 mm	5500-1260

NOTE: The A-Line Quick Connect fitting can only be equipped with an A-Line capillary specified in this table. The A-Line capillary is designed with a spring and a holder. 0.25 mm id solutions are optimized for Waters Alliance.

Agilent A-Line Stay Safe Caps

- Stop 99.9% of solvents leaching into the air to protect your health
- Prevent solvent decomposition and protect your chromatographic results
- Ensure the long-term consistency of your mobile phase and chromatographic results

Because no one wants to worry about solvents leaching into the air

Acetonitrile and methanol are just two of the toxic compounds you may be exposed to every day. Fortunately, you can count on Agilent A-Line Stay Safe caps to stop 99.9% of solvents from leaching into the air—protecting you and your coworkers. But that's not all...

A-Line Stay Safe caps also promote mobile phase consistency

Over time, solvent composition can change, affecting your chromatographic results. Storing solvents with airtight Stay Safe caps prevents this problem, ensuring the long-term consistency of your mobile phase and chromatographic results.

Stay Safe caps include a time strip that tells you when the venting valve needs to be replaced. We recommend changing the A-Line venting valve or the A-Line charcoal filter after six months of usage under the following conditions:

· 1 mL/min
· 8 hours per day
· 5 days per week
· Under typical lab conditions at 20 °C

Through innovative design Agilent A-Line Stay Safe caps stop 99.9% of solvents from leaching into the air, making your lab a safer workplace.

A-Line Stay Safe Caps

	Description	Ports				Part No.
		Fittings	Vent	Filter	Waste	
	GL45 with 1 port 1 vent value with time strip (5043-1190)	1 x 3.2 mm	1			5043-1217
	GL45 with 2 ports 1 vent value with time strip (5043-1190)	2 x 3.2 mm	1			5043-1218
	GL45 with 3 ports 1 vent value with time strip (5043-1190)	3 x 3.2 mm	1			5043-1219
	GL45 with 4 ports 1 leak hose	4 (2 x 3.2 mm, 1 x 2.3 mm, 1 x 1.6 mm)		1	1	5043-1220

Kits

Description	Part No.
6 L waste can (5043-1196) Stay Safe cap GL45 with 4 ports (5043-1220)	5043-1221
Infinity Stay Safe cap kit—contains: 4 caps • 3 (5043-1217) • 1 (5043-1218) 4 venting valves with time strip (5043-1190) 4 fittings (3.2 mm)	5043-1222

For Fitting Ports

Description	Part No.
Fitting for 3.2 mm tubing, PFA, 2/pk	5043-1216
Fitting for 2.3 mm tubing, PFA, 2/pk	5043-1215
Fitting for 1.6 mm tubing, PFA, 2/pk	5043-1214
Screw plug 1/8 in, PTFE, 2/pk	5043-1198

For Vent Ports

Description	Part No.
Venting valve with time strip, PTFE, 1 µm	5043-1190

For Filter Port

Description	Part No.
Charcoal filter with time strip (58 g) for waste container	5043-1193

For Waste Port

Description	Part No.
2 ports waste collector, PTFE	5043-1207
Screw plug 1/4 in, PTFE	5043-1195

Miscellaneous

Description	Part No.
Thread adapter, PTFE, GL45(M) - GL40(F)	5043-1191
Thread adapter, PTFE, GL45(M) - GPI38-430(F)	5043-1192
6 L waste can, GL45	5043-1196

PROPER INSTRUMENT MAINTENANCE FOR ALLIANCE SYSTEMS

Autosampler Routine Maintenance

Routine autosampler maintenance should be performed on a regular basis to keep your HPLC system performing at its optimum level. You can perform all maintenance procedures at once or as needed. Some parts may need to be replaced more often than others, depending upon your application and solvent preparation procedures.

Regular autosampler maintenance helps lower operating costs and generates precise results with the utmost confidence. By following a regular maintenance routine, you can count on maximum uptime during the life of your autosampler.

Waters Autosampler Routine Maintenance Procedures

- Replace the metering syringe
- Rebuild the injector seal pack and replace the needle
- Rebuild the high-pressure motorized valves
- Replace the inline filter insert
- Adjust the seal pack seal valves

Waters Autosampler Routine Maintenance and Troubleshooting

Symptom	Cause	Solution
Poor injection reproducibility	Low sample level in vials	Confirm sample level in the vials is at minimum a quarter full
	Worn metering syringe	Replace the metering syringe assembly
	Worn high-pressure motorized valve seals	Rebuild the high-pressure motorized valves
	Leaking waste valve	Replace the waste valve
	Worn injector seals	Rebuild the injector seal pack, replace the needle, and adjust the seal pack seal valves
Leaking syringe	Worn metering syringe	Replace the metering syringe assembly
Sample carryover	Needlewash solvent exhausted	Refill the needlewash solvent reservoir
	Dirty needlewash seals	Rebuild the seal pack and adjust seal pack seal valves
	Faulty needlewash valve	Replace the needlewash valve
Sample vials filling during injection cycle	Worn high-pressure motorized valve seal	Rebuild the high-pressure motorized valves
Low peak response	Low sample level in vials	Confirm sample level in the vials is at minimum a quarter full
	Worn metering syringe	Replace the metering syringe assembly
	Worn high-pressure motorized valve seals	Rebuild the high-pressure motorized valves
	Leaking waste valve	Replace the waste valve
	Worn injector seals	Rebuild the injector seal pack, replace the needle, and adjust the seal pack seal valves

Sapphire plunger assembly, 8005-0523

HPLC Pump Routine Maintenance

Routine pump maintenance should be performed on a regular basis to keep your HPLC system performing at its optimum level. You can perform all maintenance procedures at once or as needed. Some parts may need to be replaced more often than others depending upon your application and solvent preparation procedures.

Regular pump maintenance helps lower operating costs and generates precise results with the utmost confidence. By following a regular maintenance routine, you can count on maximum uptime and a steady, accurate solvent flow for the life of the pump.

TIPS & TOOLS

Pump seals should be replaced when there are leaks on the bottom of the pump head, when retention times are inconsistent, or when the pressure ripple is unstable.

Waters Pump Routine Maintenance Procedures

- Replace the seals and plungers (or pistons)
- Replace the inline filter insert
- Replace the check valve cartridges
- Replace the seal wash seals and tube seals
- Replace the solvent inlet frits

Waters Pump Routine Maintenance Procedures

Symptom	Cause	Solution
Pressure ripple unstable	Dirty check valve cartridge(s)	Run static leak test to verify and exchange the check valve cartridge(s)
	Leak on pump head	Run static leak test to verify and exchange the inline filter insert and plunger (or piston) seals
Gradient performance problems Intermittent pressure fluctuations	Blocked solvent filter(s)	Change the solvent filter(s)
A pressure drop of greater than 10 bar (150 psi) across the inline filter (5 mL/min H_2O during wet priming)	Dirty inline filter	Exchange the inline filter insert
Leaks at lower pump head side Unstable retention time Pressure ripple unstable	High seal wear	Run leak test to verify and exchange the pump seals and inline filter insert
Seal lifetime shorter than normally expected	Scratch on plunger	Check plungers while changing the seals
		Exchange the plungers if damaged or scratched
Loss of wash solvent	Leaky wash seals	Exchange the wash seals

Troubleshooting Guide for HPLC Systems

The at-a-glance tables can help you pinpoint and solve the most common problems for your HPLC systems and ensure maximum instrument uptime and productivity.

HPLC Troubleshooting

Symptom Type	Possible Cause	Solution
Baseline disturbance at void time	Positive/negative—Difference in refractive index of injection solvent	Use mobile phase for sample solvent
Detector leaks	Plugged inlet frit	Replace seals/gaskets
Drifting baseline	Positive direction—Contaminant buildup/elution	Flush column, clean up sample, use pure solvents
	Positive/negative—Difference in refractive index of injection solvent	Use mobile phase for sample solvent
	Negative direction (gradient)—Absorbance of "A" mobile phase solvent	Use non-absorbing or HPLC-grade or better solvent
	Positive direction (gradient)—Absorbance of "B" mobile phase solvent	Use non-absorbing or HPLC-grade or better solvent
	Random—Temperature changes	Insulate column and tubing
	Random—Temperature changes	Thermostat column and tubing
	Wavy or undulating—Temperature changes in room	Monitor room temperature and control
Ghost peaks	Peaks from previous injection	Flush column to remove contaminants
	Contamination	Sample cleanup or pre-fractionation
	Unknown interferences in samples	Sample cleanup or pre-fractionation
	Ion-pair—Upset equilibrium	Prepare sample in actual mobile phase to minimize disturbance
	Peptide mapping—Oxidation of TFA	Prepare fresh daily; use anti-oxidant
	Reversed-phase—Contaminated water	Check suitability of water by running different amount through reversed-phase column and measure peak height with elution; use HPLC grade solvents
	Spikes—Bubbles in solvent	De-gas solvents
High column backpressure	Column blockage, adsorbed sample	Better sample cleanup; use guard column
	Mobile phase viscosity too high	Use lower viscosity solvents or higher temperature
	Particle size too small	Use larger d_p packing
	Plugged inlet frit	Replace column
	Plugged inlet frit	Reverse solvent flow

(Continued)

HPLC Troubleshooting

Symptom Type	Possible Cause	Solution
Leaks	Subtle—White powder at fitting/loose fitting	Tighten fittings, cut tubing, or replace ferrules
Leaks, injection valve	Catastrophic—Worn valve rotor	Replace rotor in valve
Leaks, column or other fittings	Catastrophic—Loose fittings	Tighten or replace fittings
Leak, pump	Catastrophic—Pump seal failure	Replace pump seal
Negative peaks	RI detector—Solute refractive index less than solvent	No problem; reverse polarity to make positive
	UV detector—Solute absorbance less than mobile phase	Use mobile phase with lower UV absorbance; do not recycle solvent too many times
Noisy baseline	Random—Contaminant buildup	Flush column; clean up sample; use HPLC-grade solvent
	Continuous—Detector lamp problem	Replace detector lamp
	Occasional—External electrical interference	Use voltage stabilizer for LC system
Peak doubling	Sample volume too large	Reduce the volume e.g. by half and re-inject
	Injection solvent too strong	Use weaker injection solvent or mobile phase
	Blocked frit	Replace and use 0.5 µm porosity inline filter
	Column void or channeling	Replace column; for some columns, fill in void with packing
	Unswept injector flowpath	Replace injector rotor
	Void at head of column	Replace column, top off column with packing
	Column overloaded with sample	Use higher capacity stationary phase Increase column diameter Decrease sample size
	Single peak—Interfering components	Sample cleanup; pre-fractionation
Peak tailing	Beginning of peak doubling	See "peak doubling"
	Unswept dead volumes	Minimize number of connections Ensure injector seal is tight Ensure fittings are properly seated
	Basic compounds—Silanol interactions	Choose endcapped bonded phase Switch to polymeric phase
	Basic substances—Silanol interactions	Use stronger mobile phase or add competing base (e.g. TMA)
	Silica-based—Column degradation	Use specialty column; polymeric column or sterically protected

(Continued)

HPLC Troubleshooting

Symptom Type	Possible Cause	Solution
Peaks are broad	Injection volume too large	Decrease solvent strength of injection solvent to focus solute
	Peak dispersion in injector valve	Introduce air bubble in front/back of sample to decrease dispersion
	Sampling rate of data system too slow	Increase frequency of sampling
	Slow detector time constant	Adjust time constant to match peak width
	Mobile phase viscosity too high	Increase column temperature
	Detector cell volume too large	Use smallest possible cell volume with no heat exchanger in system
	Injector volume too large	Decrease injection volume
	Long retention times	Use gradient elution or stronger mobile phase
Pressure fluctuation	Leaky check valve	Replace check valve
	Pump seal leaks	Replace pump seals
	Buildup of particulates	Filter sample; inline filter; filter mobile phase
Pressure increasing	Buildup of particulates	Filter sample; inline filter; filter mobile phase
	Water/organic systems—Buffer precipitation	Test buffer-organic mixtures; ensure compatibility
Retention beyond total permeation volume	Size exclusion—Specific interactions	Add mobile phase modifiers or change solvent
Retention times changing	Column temperature varying	Thermostat column; insulate column; ensure lab temperature constant
	Equilibration time insufficient with gradient run or changes in isocratic mobile phase	Make sure at least 10 column volumes pass through column after solvent change or gradient conclusion
	Selective evaporation of mobile phase component	Less vigorous helium sparging; keep solvent reservoirs covered; prepare fresh mobile phase
	Buffer capacity insufficient	Use >20 mM concentration of buffer
	Inconsistent online mobile phase mixing	Ensure gradient system delivering constant composition; check vs. manual prep of mobile phase
	Contamination buildup	Occasionally flush column with strong solvent to remove contaminants
	First few injections—Adsorption on active sites	Condition column by initial injection of concentrated sample
Retention times decreasing	Flow rate increasing	Check pump to make sure correct; if not, reset
	Column overloaded with sample	Decrease sample size
	Loss of bonded stationary phase	Keep mobile phase pH between 2 and 8.5

(Continued)

HPLC Troubleshooting

Symptom Type	Possible Cause	Solution
Retention times increasing	Flow rate is slowing	Fix leaks in liquid lines, replace pump seals, check for pump cavitation or air bubbles
	Active sites on silica packing	Use mobile phase modifier
	Loss of bonded stationary phase	Keep mobile phase pH between 2 and 8.5
	Mobile phase composition changing	Make sure mobile phase container is covered
	Active sites on silica packing	Add competing base to mobile phase
	Active sites on silica packing	Use higher coverage packing for stationary phase
Sensitivity problem	Peaks are outside linear range of detector	Dilute/concentrate to bring into linear region
	First few sample injections—Absorption of sample in loop or column	Condition loop/column with concentrated sample
	Autosampler flow lines blocked	Check flow and make sure there are no blockages
	Injector sample loop underfilled	Make sure that loop is overfilled with sample
	Sample-related losses during preparation	Use internal standard during sample prep; optimize sample prep method
Slow column equilibration times (ion-pairing)	Equilibration time slow for long-chain ion-pairing reagents	Use shorter alkyl chain ion-pair reagent

515 pump PM kit, 8005-0913

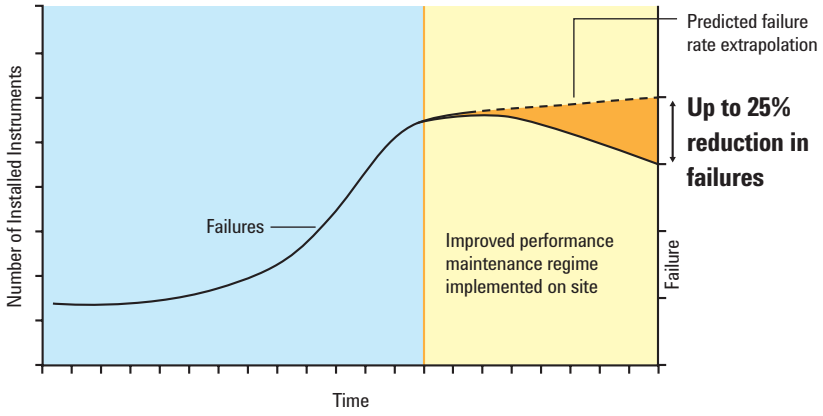
2960/2965 PM kit, 8005-0915

Maintenance reduces downtime up to 25%

Performance maintenance kits make it easier to keep your instruments running at peak performance

Many instrument failures are not caused by functional breakdowns, but by a lack of performance maintenance. As suggested by a recent study, a regular performance maintenance program can reduce instrument failure rates up to 25%, and is critical to ensure optimal overall system operations.

The Effect of Performance Maintenance



Agilent PM kits contain the normal wear parts, tools for disassembly/reassembly, and instructions necessary to keep your systems operating at peak performance. The kits provide a convenient, cost-effective way to make sure your instruments are properly maintained. Each kit contains all the parts you need to:

- Boost system efficiency and reliability
- Reduce unplanned downtime and repair costs
- Increase accuracy by enhancing precision and sensitivity
- Comply with regulatory requirements, or meet quality accreditation standards
- Extend instrument life
- Eliminate individual part ordering

PM kits are available for pumps, valves, autosamplers, and HPLC systems.

2695 Separations Module, Enhanced PM

Description	Unit	Similar to Waters Part No.	Part No.
2695 Separations Module, Enhanced PM			**8005-0999**
Piston Seal (standard)	2/pk	WAT270938	8005-0535
Piston	1/pk	WAT270959	8005-0538
Inline Filter Element	1/pk	WAT088084	8005-0424
Wash Tube Seal Replacement Kit	4/pk	WAT270940	8005-0557
Seal Wash Plunger Seal	2/pk	WAT271018	8005-0540
Head Face Seals	4/pk	WAT270939	8005-0536
Check Valve Replacement Kit	2/pk	WAT270941	8005-0537
Solvent Filter Assembly	1/pk	WAT025531	8005-0849
M715 Seal, HPMV	1/pk	WAT045454	8005-0425
Seal, Insert	1/pk	WAT021132	8005-0426
O-ring, PTFE, 440/441	2/pk	WAT097387	8005-0427
Seal Pack Rebuild Kit	1/pk	WAT271019	8005-0916
Syringe Assembly, 250 µL	1/pk	WAT073109	8005-0419
Battery, 3 V	1/pk	WAT80443	8005-0428

1525 Pump, 225 µL Head

Module/System	Similar to Waters Part No.	Part No.
1525 Pump, 225 µL head		**8005-0429**
Extended Flow Plunger Seal, 225 µL	700002282	N/A
Outlet Check Valve and Housing, 225 µL	WAT025216	8005-0430
Reference Valve Rebuild Kit	WAT025746	8005-0911
Extended Flow Plunger	WAT60304	8005-0431
Inlet Check Valve and Housing	WAT60307	8005-0432
Solvent Filter	WAT025531	8005-0849

1525 Pump, 100 µL Head

Module/System	Similar to Waters Part No.	Part No.
1525 Pump, 100 µL head		**8005-0433**
100 Plunger Seal, Clear	WAT022934	8005-0524
Check Valve Cartridges, 2/pk	WAT700000254	8005-0513
Plunger	WAT207069	8005-0523
Reference Valve Rebuild Kit	WAT025746	8005-0911
Solvent Filter	WAT025531	8005-0849

1525 Pump, 50 µL Head

Module/System	Similar to Waters Part No.	Part No.
1525 Pump, 50 µL head		**8005-0434**
1525 Micro Seal Kit	WAT205000202	
Plunger	WAT30547	8005-0549
Check Valve Cartridges, 2/pk	WAT700000254	8005-0513
Solvent Filter	WAT025531	8005-0849

1515 Pump, 100 µL Head

Module/System	Similar to Waters Part No.	Part No.
1515 Pump, 100 µL head		**8005-0435**
100 Plunger Seal, Clear	WAT022934	8005-0524
Plunger	WAT207069	8005-0523
Check Valve Cartridges, 2/pk	WAT700000254	8005-0513
Reference Valve Rebuild Kit	WAT025746	8005-0911
Solvent Filter	WAT025531	8005-0849

2695 Separations Module, Standard PM

Module/System	Similar to Waters Part No.	Part No.
2695 Separations Module, Standard PM		**8005-0998**
Piston Seal, Standard, 2/pk	WAT270938	8005-0535
Inline Filter Element	WAT088084	8005-0424
Seal Wash Plunger Seal, 2/pk	WAT271018	8005-0540
Seal, Insert	WAT021132	8004-0426
Seal Pack Rebuild Kit With Needle	WAT271019	8005-0916
Syringe Seal Kit (syringe seals and plunger tips)	WAT073210	8005-0437
Battery, 3 V	WAT80443	8005-0428

1525 Pump, 100 µL Head, Micro

Module/System	Similar to Waters Part No.	Part No.
1525 Pump, 100 µL head, micro		**8005-0440**
Extended Flow Plunger Seal	700002282	
Outlet Check Valve and Housing	WAT25216	8005-0430
100 Plunger Seal, Clear	WAT022934	8005-0524

1525 Pump, 50 µL Head, Micro

Module/System	Similar to Waters Part No.	Part No.
1525 Pump, 50 µL Head, Micro		**8005-0439**
1525 Micro Seal Kit	WAT205000202	8005-0524

Performance Maintenance Kits

Model	Description	Kit Contents	Similar to Waters Part No.	Part No.
Performance Maintenance Kits for Rheodyne Valves				
Rheodyne Injector, 3725(i)	Performance Maintenance Kit for Rheodyne 3725(i) Injector Valves	Rotor seal (PEEK), stator face assembly (PEEK), isolation seal, needle guide, needle port cleaner, hex key (5/64 in), hex key (9/64 in), instructions	201000116	8005-0901
Rheodyne Injector, 7010	Performance Maintenance Kit for Rheodyne 7010 Injector Valves	Isolation seal, Rotor seal (Vespel), hex key (5/64 in), hex key (9/64 in), instructions	201000117	8005-0902
Rheodyne Injector, 7125 and 7126	Performance Maintenance Kit for Rheodyne 7125 and 7126 Injector Valves	Rotor seal (Vespel), stator face assembly (PEEK/ceramic), isolation seal, needle guide, needle port cleaner, hex key (5/64 in), hex key (9/64 in), instructions	201000118	8005-0903
Rheodyne Injector, 7725(i)	Performance Maintenance Kit for Rheodyne 7725(i) Injector Valves	Stator face assembly (PEEK/ceramic), rotor seal (Vespel), isolation seal, needle guide, needle port cleaner, hex key (5/64 in), hex key (9/64 in), instructions	201000119	8005-0904
Rheodyne Injector, 7750E	Performance Maintenance Kit for Rheodyne 7750 Injector Valves	Stator face assembly (PEEK/ceramic), rotor seal (Vespel), isolation seal, hex key (9/64 in), instructions	201000122	8005-0907
Rheodyne Injector, 7750E-075	Performance Maintenance Kit for Rheodyne 7750E-075 Valves	Rotor seal (PEEK), stator face assembly (PEEK), isolation seal, hex key (9/64 in), instructions	201000125	8005-0908
Rheodyne Injector, 8125 and 8126	Performance Maintenance Kit for Rheodyne 8125 and 8126 Injector Valves	Stator face assembly (PEEK/ceramic), rotor seal (PEEK), isolation seal, needle guide, needle port cleaner, hex key (5/64 in), hex key (9/64 in), instructions	201000120	8005-0905
Rheodyne Injector, 9125 and 9126	Performance Maintenance Kit for Rheodyne 9125 and 9126 Injector Valves	Stator face assembly (PEEK/ceramic), rotor seal (Tefzel), isolation seal, needle guide, needle port cleaner, hex key (5/64 in), hex key (9/64 in), instructions	201000121	8005-0906

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Rheodyne 7725(i) PM kit, 8005-0904

Rheodyne 9125 PM kit, 8005-0906

Pump Supplies

Model	Description	Unit	Similar to Waters Part No.	Part No.
Plungers and Seals				
2690 Separations Module 2690D Dissolution Separations Module 2695 Separations Module 2695D Dissolution Separations Module 2790 Separations Module 2795 Separations Module 2796 Bioseparations Module	Sapphire plunger assembly, standard	1/pk	WAT270959	8005-0538
2690 Separations Module 2690D Dissolution Separations Module 2695 Separations Module 2695D Dissolution Separations Module	Plunger seals, clear	2/pk	700001326	8005-0514
2690 Separations Module 2690D Dissolution Separations Module 2695 Separations Module 2695D Dissolution Separations Module 2790 Separations Module 2795 Separations Module Alliance GPC/V 2000 Systems	Plunger seal replacement kit, standard, yellow	2/pk	WAT270938	8005-0535
2690 Separations Module 2690D Dissolution Separations Module 2695 Separations Module 2695D Dissolution Separations Module 2790 Separations Module 2795 Separations Module	Plunger seal replacement kit, black	2/pk	WAT271066	8005-0541

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Sapphire plunger assembly, 8005-0538

Plunger seal replacement kit, 8005-0535

Plunger seal replacement kit, 8005-0541

Pump Supplies

Model	Description	Unit	Similar to Waters Part No.	Part No.
Plungers and Seals				
2690 Separations Module 2690D Dissolution Separations Module 2695 Separations Module 2695D Dissolution Separations Module 2790 Separations Module 2795 Separations Module Alliance GPC/V 2000 Systems	Face seals replacement kit	4/pk	WAT270939	8005-0536
2690 Separations Module 2690D Dissolution Separations Module 2695 Separations Module 2695D Dissolution Separations Module 2790 Separations Module 2795 Separations Module Alliance GPC/V 2000 Systems	Seal wash face seal kit	1/pk	WAT271017	8005-0539
2796 Bioseparations Module	Seal wash, plunger seal	4/pk	700002258	8005-0516
2796 Bioseparations Module	Plunger seal, standard	2/pk	700002257	8005-0515
2690 Separations Module 2690D Dissolution Separations Module 2695 Separations Module 2695D Dissolution Separations Module 2790 Separations Module 2795 Separations Module Alliance GPC/V 2000 Systems	Seal wash plunger seal replacement kit	2/pk	WAT271018	8005-0540
510 HPLC Pump	Sapphire plunger	1/pk	WAT025656	8005-0527
600 MultiSolvent Delivery System 610 PowerLine Isocratic Pump LC Module 1	Oriented sapphire plunger	1/pk	WAT069511	8005-0533

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Face seals replacement kit, 8005-0536

Seal wash face seal kit, 8005-0539

Pump Supplies

Model	Description	Unit	Similar to Waters Part No.	Part No.
Plungers and Seals				
510 HPLC Pump 515 HPLC Pump 600 MultiSolvent Delivery System LC Module 1	Plunger seal, graphite-filled, PTFE (GFP), black	1/pk	WAT026613	8005-0529
510 HPLC Pump 515 HPLC Pump 600 MultiSolvent Delivery System 610 PowerLine Isocratic Pump LC Module 1	Plunger seal, black, 225 µL	1/pk	WAT026644	8005-0530
616 LC System 626 LC System	Sapphire plunger	1/pk	WAT031788	8005-0531
1515 HPLC Pump 1525 HPLC Pump 515 HPLC Pump	Sapphire plunger assembly	1/pk	WAS207069	8005-0523
1515 HPLC Pump	Plunger seal, clear	1/pk	WAT022934	8005-0524
1525 HPLC Pump 510 HPLC Pump 515 HPLC Pump 600 MultiSolvent Delivery System 610 PowerLine Isocratic Pump LC Module 1	Plunger seal, clear	4/pk	WAT022946	8005-0525
Check Valves and Cartridges				
2690 Separations Module 2690D Dissolution Separations Module 2695 Separations Module 2695D Dissolution Separations Module 2790 Separations Module 2795 Separations Module Alliance GPC/V 2000 Systems	Check valve cartridge replacement kit	2/pk	WAT270941	8005-0537

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Pump Supplies

Model	Description	Unit	Similar to Waters Part No.	Part No.
Check Valves and Cartridges				
626 LC System	Check valve cartridge	1/pk	WAT024120	8005-0526
1515 HPLC Pump 1525 HPLC Pump 2695 Separations Module 2695D Dissolution Separations Module 2795 Separations Module 510 HPLC Pump 515 HPLC Pump 600 MultiSolvent Delivery System 610 PowerLine Isocratic Pump LC Module 1	Check valve cartridge	2/pk	700000254	8005-0513
1525 HPLC Pump 2695 Separations Module 2695D Dissolution Separations Module 2795 Separations Module 515 HPLC Pump 600 MultiSolvent Delivery System	Check valve cartridge	1/pk	700002399	8005-0508
1515 HPLC Pump 1525 HPLC Pump 515 HPLC Pump 600 MultiSolvent Delivery System LC Module 1	Cartridge check valve system	2/pk	700000253	8005-0512
510 HPLC Pump 515 HPLC Pump 600 MultiSolvent Delivery System 610 PowerLine Isocratic Pump LC Module 1	Outlet check valve rebuild kit, 225 µL	2/pk	WAT026014	8005-0528

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Detector Supplies

Model	Description	Unit	Similar to Waters Part No.	Part No.
2996 Photodiode Array Detector 996 Photodiode Array Detector	Cell gasket	2/pk	WAT057924	8005-0532

Valve Replacement Parts, 1/pk

Model	Description	Similar to Waters Part No.	Part No.
2767/2747 Sample Manager Column/Fluidics Organizer	Stator, 6 port, stainless steel	700001560	8005-0601
Rheodyne 7725(i) Injector	Vespel rotor seal	WAT055946	8005-0604
626 LC System Rheodyne 9125 Injector	Tefzel rotor seal	WAT015781	8005-0603
2700 Sample Manager	Rotor seal	WAT272615	8005-0605
2707 Autosampler	Rotor seal	700003851	8005-0602

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Rheodyne stator, 8005-0601

Vespel rotor seal, for Rheodyne 7725(i), 8005-0604

Tefzel rotor seal, 8005-0603

Sample Loops, 1/pk

Model	Volume (µL)	Material	Similar to Waters Part No.	Part No.
2690 Separations Module 2690D Dissolution Separations Module 2695 Separations Module 2695D Dissolution Separations Module	100	Stainless steel	430001194	8005-0840
2695 Separations Module 2695D Dissolution Separations Module	200	Stainless steel	430001630	8005-0841
2796 Bioseparations Module	20	PEEK	430000782	8005-0838
2796 Bioseparations Module	100	PEEK	430000783	8005-0839
2707 Autosampler CapLC System CapLC XE System	5	Stainless steel	700000683	8005-0843
2707 Autosampler	10	Stainless steel	700003872	8005-0845
2707 Autosampler CapLC System CapLC XE System	20	Stainless steel	700000680	8005-0842
2707 Autosampler	50	Stainless steel	700003928	8005-0846
2707 Autosampler CapLC System CapLC XE System	100	Stainless steel	700000685	8005-0844

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HPLC Capillaries and Capillary Fittings

HPLC Capillaries, 1/pk

Model	From	To	Material	OD (mm)	ID (mm)	Length (mm)	Fittings	Similar to Waters Part No.	Part No.
2690 Separations Module 2690D Dissolution Separations Module 2695 Separations Module 2695D Dissolution Separations Module	Pump	Autosampler	Stainless steel	1.6	0.23	760	With fittings, pre-swaged on both ends	WAT270975	8005-0824
2690 Separations Module 2690D Dissolution Separations Module 2695 Separations Module 2695D Dissolution Separations Module 2790 Separations Module 2795 Separations Module	Autosampler	Column Thermostat Valve	Stainless steel	1.6	0.23	760	With fittings, pre-swaged on both ends	WAT270979	8005-0825
2695 Separations Module 2695D Dissolution Separations Module	Autosampler	Column Thermostat Valve	PEEK	1.6	0.13	6,000	With fittings, non pre-swaged	430000922	8005-0812

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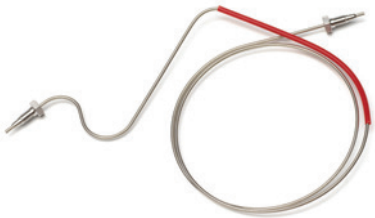

Capillary, stainless steel, 8005-0825

Capillary, PEEK, 8005-0812

HPLC Capillaries, 1/pk

Model	From	To	Material	OD (mm)	ID (mm)	Length (mm)	Fittings	Similar to Waters Part No.	Part No.
Alliance	Column Thermostat Valve	Column	Stainless steel	1.6	0.23	3,000	No fittings	WAT026973	8005-0823
	Column	Detector							
Alliance	Column Thermostat Valve	Column	Stainless steel	1.6	0.508	3,000	No fittings	WAT026804	8005-0826
	Column	Detector							
Alliance	Column Thermostat Valve	Column	Stainless steel	1.6	1.02	3,000	No fittings	WAT026805	8005-0822
	Column	Detector							
Fittings									
Alliance	Compression screws and ferrules							WAT025604	8005-0835*

*This fitting is used with 8005-0823, 8005-0826, and 8005-0822

Capillary, stainless steel, 8005-0823

HPLC Fittings, Ferrules, and Unions

Description	Unit	Similar to Waters Part No.	Part No.
Compression screw, stainless steel, 1/16 in od	10/pk	WAT005070	8005-0837
Compression screws and ferrules	5/pk	WAT025604	8005-0835
Union, stainless steel, 1/16 in od	1/pk	WAT097332	8005-0836

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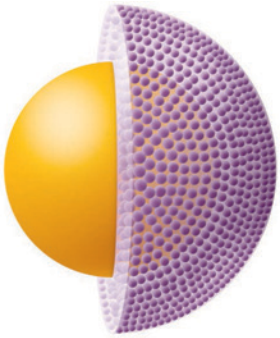


AGILENT LC COLUMNS AND SUPPLIES FOR SMALL MOLECULE ANALYSIS

Make every HPLC in your lab work harder

The Poroshell 120 column family gives you the benefits of exceptional efficiency—more speed and more resolution—on your conventional HPLC instruments, and great performance on your UHPLC, too.

Poroshell 120 columns provide the speed and resolution of a sub-2 µm column with much less backpressure, and so you can push every analysis further.

To offer you even more choices for refining challenging analyses, the Poroshell 120 family is expanding. Now, there are TWO particle sizes (2.7 and 4 µm) so you can choose the option to best fit your needs. Also, with 12 chemistries available in 2.7 µm and seven chemistries in 4 µm, you have the method development flexibility you are looking for.

- **Multiple chemistries** for flexible method development
- **Larger particle size** with low backpressure—ideal for the pressure limitations of the Alliance system
- **Large frit porosity** with less likelihood of clogging with dirty samples (such as with food, environmental, or samples in plasma or urine)
- **Long lifetime** with pressure limits up to 600 bar—an ideal fit for an Alliance system
- **Scalable particle sizes** in 2.7 µm and 4 µm for drop in replacements into existing methods

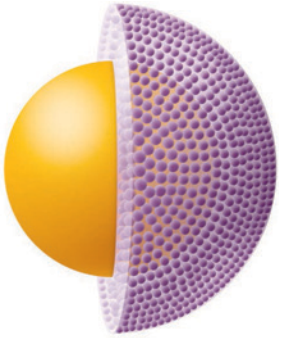
Poroshell 120, 2.7 µm—for UHPLC performance on Waters Alliance HPLC

Agilent Poroshell 120 columns are based on a 2.7 µm particle with a 1.7 µm solid core and 0.5 µm porous outer layer. This small particle size provides high efficiency, similar to sub-2 µm columns, but with 40-50% less pressure. These high efficiency, high resolution columns can be used on any type of LC. The porous outer layer and solid core limit diffusion distance, together with narrow particle size distribution create increased efficiencies enabling very fast, high resolution separations. The same principles are used in columns from the AdvanceBio family, ideal for fast, high-resolution separations of biomolecules.

Poroshell 120, 4 µm—drop-in replacement for high performance without higher pressure

These columns greatly expand the Poroshell 120 family, providing scalable solutions for chromatographers and method developers. The robust 4 µm columns deliver easy drop-in method replacement, with column backpressures typically below 200 bar, and efficiencies nearly double those of traditional, totally porous 5 µm columns. If you want easy performance increase, simply bring Poroshell 120, 4 µm columns into your Waters method.

With its exceptional flexibility, the Poroshell 120 EC-C18, 4 µm offers the best place to start your method development. However, if you are working with challenging analytes, the Poroshell 120 family has many other chemistries.



A variety of bonded phases means you never have to compromise on selectivity

Poroshell 120 columns are made at the same facility as the Agilent industry-leading ZORBAX column family. The bonding chemistries used with Poroshell 120 columns mirror those of all ZORBAX columns, giving you the advantages of easier method transfer and assured scalability from lab to lab, around the world.

All the selectivities you need to perfect your separation

An excellent first choice
Poroshell 120 EC-C18 (USP L1)* and EC-C8 (USP L7)*

You can count on this high-performance phase to deliver excellent peak shape and resolution for acids, bases, and neutrals. This chemistry is very similar to the ZORBAX Eclipse Plus phase, for easy method transferability.

TIPS & TOOLS

Watch our video demonstration to learn how to transfer a naproxen method to Poroshell 120 columns, and optimize your LC system for the best results.

Go to **www.agilent.com/chem/poroshell120video**

High pH applications

Poroshell HPH-C18 (USP L1)* and HPH-C8 (USP L7)*

The silica in this special chemistry has been modified with a proprietary process to increase stability at high pH levels.

Poroshell 120 Phenyl-Hexyl (USP L11)*

This phase offers an alternative selectivity for phenyl groups, and is very similar to ZORBAX Eclipse Plus Phenyl-Hexyl for easy method transfer.

Poroshell 120 PFP (USP L43)*

Provides an alternative selectivity for halogenated compounds and polar analytes.

Poroshell 120 Bonus-RP (USP L60)

Bonus-RP is polar-embedded to improve peak shape for basic compounds at low- and mid-pH. This phase is the same as ZORBAX Bonus-RP.

Low pH applications

StableBond SB-C18 (USP L1) and SB-C8 (USP L7)

StableBond performs well with acids, bases, and neutrals—with superior lifetime at low pH. What's more, these phases transfer readily from ZORBAX SB-C18 and ZORBAX SB-C8 phase chemistries.

Poroshell 120 HILIC*

With its unbonded silica, Poroshell 120 HILIC enables you to retain and separate small polar analytes.

Poroshell 120 EC-CN (USP L10)

Similar to ZORBAX Eclipse XDB-CN, this cyano phase simplifies method transfer.

Poroshell 120 SB-Aq

This proprietary phase provides an alternative selectivity option, and is ideal for polar compounds and high aqueous conditions. Its chemistry is the same as ZORBAX SB-Aq.

*Available in both 2.7 µm and 4 µm particle sizes.

TIPS & TOOLS

Use the Poroshell selectivity poster to find the best column for your small molecule analysis: see *A Family of Phase Choices to Perfect Every Separation* (publication 5991-6240EN).

What makes Poroshell 120 unique?
End-to-end quality control

Single-step coacervation: a key to reproducibility

Some manufacturers laboriously create the porous shell by applying layer after layer of particles. At Agilent, however, we apply the porous shell in one single step—similar to the coacervation technique used to make traditional ZORBAX columns. This unique single-step process delivers higher yields and more column-to-column reproducibility.

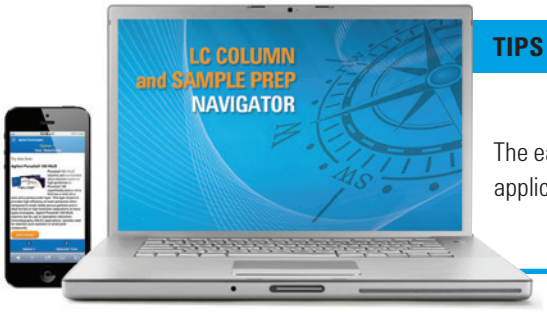
Uncompromising standards translate into reproducible results

Agilent has more than 40 years of experience manufacturing LC columns. We make all of our ZORBAX and Poroshell 120 columns in our manufacturing location in Newport, Delaware. Our experience has shown that reproducible results can only happen when every column meets the highest industry standards.

That's why we manufacture our own silica and bonded phases—and test our silica more than seven times, including chromatographic tests, across multiple sample types. We also offer multiple particle sizes, chemistries, lengths, and ids to provide global scalability and transferability.

"Better quality than other coreshell columns."

ACADEMIC LAB



TIPS & TOOLS

The easy way to find the best Agilent LC column or sample prep product for your application. Visit **www.navigator.chem.agilent.com**

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	PFP
4.6 x 150	693975-902	693975-906	683975-902	683975-906	693975-702	693975-706	683975-914	693968-901	693975-905	693975-408
4.6 x 100	695975-902	695975-906	685975-902	685975-906	695975-702	695975-706	685975-914	695968-901	695975-905	695975-408
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	699975-408
4.6 x 30	691975-902	691975-906	681975-902							
3.0 x 150	693975-302	693975-306	683975-302	683975-306	693975-502	693975-506	683975-314	693968-301	693975-305	693975-308
3.0 x 100	695975-302	695975-306	685975-302	685975-306	695975-502	695975-506	685975-314	695968-301	695975-305	695975-308
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	699975-308
3.0 x 30	691975-302	691975-306	681975-302							
2.1 x 150	693775-902	693775-906	683775-902	683775-906	693775-702	693775-706	683775-914	693768-901	693775-905	693775-408
2.1 x 100	695775-902	695775-906	685775-902	685775-906	695775-702	695775-706	685775-914	695768-901	695775-905	695775-408
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	699775-408
2.1 x 30	691775-902	691775-906	681775-902							

Poroshell 120, 4 µm

Size (mm)	EC-C18	EC-C8	HPH-C18	HPH-C8	PFP	Phenyl-Hexyl	HILIC
4.6 x 250	690970-902	690970-906	690970-702	690970-706	690970-408	690970-912	690970-901
4.6 x 150	693970-902	693970-906	693970-702	693970-706	693970-408	693970-912	693970-901
4.6 x 100	695970-902	695970-906	695970-702	695970-706	695970-408	695970-912	695970-901
4.6 x 50	699970-902	699970-906	699970-702	699970-706	699970-408	699970-912	699970-901
3.0 x 250	690970-302	690970-306	690970-502	690970-506	690970-308	690970-312	690970-301
3.0 x 150	693970-302	693970-306	693970-502	693970-506	693970-308	693970-312	693970-301
3.0 x 100	695970-302	695970-306	695970-502	695970-506	695970-308	695970-312	695970-301
3.0 x 50	699970-302	699970-306	699970-502	699970-506	699970-308	699970-312	699970-301
2.1 x 250	650750-902	650750-906	690770-702	690770-706	650750-408	650750-912	650750-901
2.1 x 150	693770-902	693770-906	693770-702	693770-706	693770-408	693770-912	693770-901
2.1 x 100	695770-902	695770-906	695770-702	695770-706	695770-408	695770-912	695770-901
2.1 x 50	699770-902	699770-906	699770-702	699770-706	699770-408	699770-912	699770-901

Poroshell 120 Fast Guards for UHPLC 2.7 µm Columns

Size (mm)	EC-C18	EC-C8	EC-CN	SB-C18	SB-C8	HPH-C18	HPH-C8	SB-Aq	Bonus-RP	Phenyl-Hexyl	HILIC	PFP
4.6 x 5	820750-911	820750-913	820750-927	820750-912	820750-923	820750-921	820750-922	820750-924	820750-925	820750-914	820750-926	
3.0 x 5	823750-911	823750-913	823750-927	823750-912	823750-923	823750-921	823750-922	823750-924	823750-925	823750-914	823750-926	
2.1 x 5	821725-911	821725-913	821725-927	821725-912	821725-923	821725-921	821725-922	821725-924	821725-925	821725-914	821725-926	821725-915

Guard Columns for 4 µm

Size (mm)	EC-C18	HPH-C18	HPH-C8
4.6 x 5	820750-916	820750-930	820750-929
3.0 x 5	823750-916	823750-930	823750-929
2.1 x 5	821725-916	821725-930	821725-929

PRIMARY STRUCTURE ANALYSIS

What is a biocolumn?

Biochromatography columns, or biocolumns, are liquid chromatography columns used for the separation of biological compounds such as peptides and proteins, oligonucleotides and polynucleotides, and other biomolecules and complexes. Biocolumns are specifically designed for biomolecule analysis with larger pore sizes to accommodate larger molecule sizes. Media are designed to minimize nonspecific binding of analytes for improved recovery. Separation mechanisms are chosen to either retain biological function so that bioactivity is not lost during analysis, or to deliberately denature for primary structure characterization.

Agilent biocolumns provide solutions for all the major characterization techniques required for your biomolecule analysis. These include:

Titer determination and purification: Use unique technology such as AdvanceBio Bio-Monolith Protein A to perform titer determination and cell-line optimization.

Intact and posttranslational modification: Use key technologies such as AdvanceBio RP-mAb, ZORBAX RRHD 300Å, Poroshell 300, and AdvanceBio Peptide Mapping for confidence in results from primary structural characterization through analysis of intact or fragmented proteins.

Aggregation: Agilent Bio SEC-3 and Agilent Bio SEC-5 accurately measure aggregates (dimers, trimers, tetramers, etc.) and separate low molecular excipients and impurities from larger molecular weight proteins.

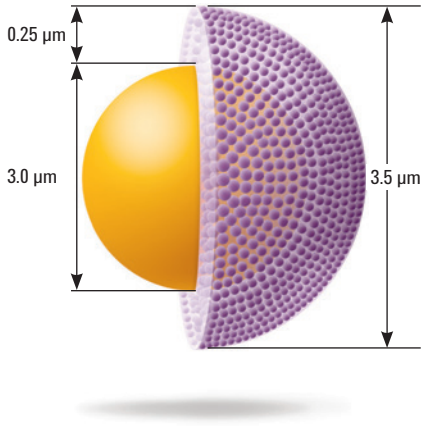
Charge variants: Agilent ion-exchange columns include optimized chemistries for monoclonal antibody analysis, such as Agilent Bio mAb and Agilent Bio IEX for accurate isoform analysis.

Glycosylation characterization: Agilent hydrophilic interaction chromatography (HILIC) columns deliver accurate and reproducible glycan and glycopeptide analysis.

Special applications: Includes robust, high efficiency solutions for amino acid analysis through the ZORBAX Eclipse AAA column and AdvanceBio Oligonucleotide columns and standards for synthetic oligonucleotide impurity profiling.

Recently, Agilent introduced the AdvanceBio family to enable protein and mAb characterization. Agilent AdvanceBio columns are designed to advance accuracy and speed for your characterization of monoclonal antibodies and other intact proteins, aggregation with SEC, charge variants with IEX, intact mass, primary structure, and posttranslational modifications (PTMs) by reversed-phase, and cleaved glycan analysis by hydrophilic interaction chromatography.

The AdvanceBio family features the Agilent tradition of innovation in superficially porous silica-based columns for biomolecule separations—which began with Poroshell 300 and now includes AdvanceBio Peptide Mapping, AdvanceBio Glycan Mapping, AdvanceBio RP-mAb, and AdvanceBio Oligonucleotide.



AdvanceBio RP-mAb

- **Improved accuracy:** Superficially porous particles (3.5 µm) with wide pores (450Å) increase mAb resolution while maintaining compatibility with all LC instruments
- **Speed:** Shorter analysis times compared to columns packed with fully porous particles
- **Flexible method development:** Range of chemistries—SB-C8, C4, and Diphenyl
- **Lower costs:** Robust Poroshell packed bed and 2 µm inlet frit extend column lifetime by helping prevent inlet blockage

The only reversed-phase columns focused on the unique challenges of monoclonal antibody characterization

Analysis of intact and reduced monoclonal antibodies are critical measurements for characterizing therapeutic proteins and understanding their efficacy and stability. Poor chromatographic separations can result in rework and even compromise the accuracy of the characterization. Long analysis times negatively impact the throughput of a laboratory and lead to delays in making decisions based on the results of characterization.

To eliminate these problems, Agilent has developed a new reversed-phase column to optimize the performance of intact and reduced mAb analysis. The Agilent AdvanceBio RP-mAb column is based on Poroshell technology with unique engineering for pore size and bonded phases.

TIPS & TOOLS

For more information on the characterization of monoclonal antibody primary structure, see: *Better Characterization of Biomolecules using Agilent AdvanceBio Reversed-Phase Columns* (publication 5991-2032EN)

www.agilent.com/chem/library

Column Specifications

Bonded Phase	Pore Size	Temp Limits*	pH Range	Endcapped
AdvanceBio RP-mAb C4	450Å	90 °C	1.0-8.0	Yes
AdvanceBio RP-mAb SB-C8	450Å	90 °C	1.0-8.0	No
AdvanceBio RP-mAb Diphenyl	450Å	90 °C	1.0-8.0	Yes

Specifications represent typical values only.
*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.

High speed, high resolution separation of Herceptin Variant IgG1

Column: **AdvanceBio RP-mAb C4**
795775-904
2.1 x 100 mm, 3.5 µm

Mobile Phase: A: 0.1% TFA in water:IPA (98.2)
B: IPA:ACN:Mobile phase A (70:20:10)

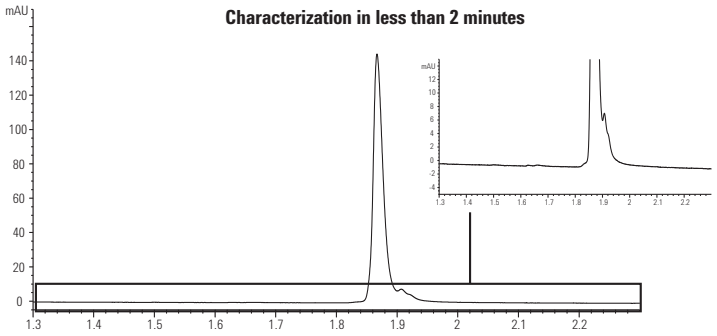
Flow Rate: 1.0 mL/min

Gradient: 10-58% B in 4 min, 1 min wash at 95% B, 1 min re-equilibration at 10% B

Temperature: 80 °C

Detector: UV, 254 nm

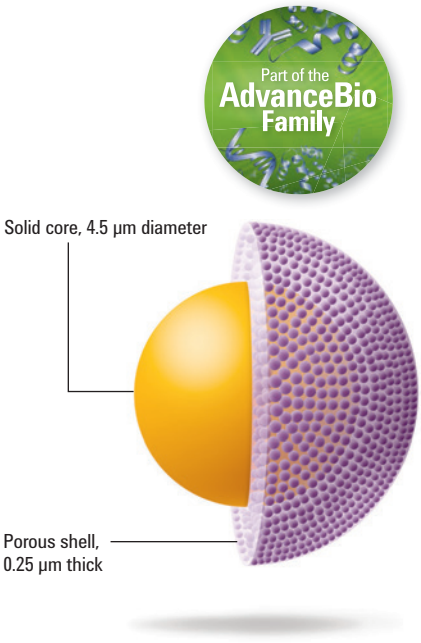
Sample: 5 µL injection of humanized recombinant Herceptin Variant IgG1 intact from Creative Biolabs (1 mg/mL)



AdvanceBio RP-mAb C4 provides a sharp peak and resolves fine detail in less than 2 minutes.

AdvanceBio RP-mAb

Size (mm)	Particle Size (µm)	AdvanceBio RP-mAb C4 USP L26	AdvanceBio RP-mAb SB-C8 USP L7	AdvanceBio RP-mAb Diphenyl USP L11
4.6 x 150	3.5	793975-904	783975-906	793975-944
4.6 x 100	3.5	795975-904	785975-906	795975-944
4.6 x 50	3.5	799975-904	789975-906	799975-944
2.1 x 150	3.5	793775-904	783775-906	793775-944
2.1 x 100	3.5	795775-904	785775-906	795775-944
2.1 x 75	3.5	797775-904	787775-906	797775-944
2.1 x 50	3.5	799775-904	789775-906	799775-944



Poroshell 300

- High speed separations of biomolecules with superficially porous particles
- 300Å pores provide high efficiency and recovery with proteins (up to 1,000 kDa)
- Achieve long lifetime at low pH with Poroshell 300SB; at high pH with 300Extend-C18
- Optimize recovery and selectivity with four different bonded phases—300SB-C18, 300SB-C8, 300SB-C3, and 300Extend-C18

Agilent Poroshell 300 columns are ideal for fast separations of proteins and peptides because the 5 µm diameter superficially porous particle allows for fast flow rates to be used while maintaining sharp, efficient peaks. Poroshell columns with StableBond bonded phases provide excellent stability and selectivity choices with TFA and formic acid mobile phases. The Poroshell 300Extend-C18 column can be used from pH 2 to 11 for unique separations. These columns can also be used for analytical protein separations and LC/MS separations.

Peptides and proteins are typically separated slowly to reduce the potential peak broadening of these slow diffusing analytes. However, Poroshell columns use a superficially porous particle made with a thin layer of porous silica, 0.25 µm thick, on a solid core of silica. This reduces the diffusion distance for proteins, making rapid HPLC separations of peptides and proteins up to 500 to 1,000 kDa possible with 400/600 bar HPLC systems.

Poroshell 300 Columns

UHPLC Column Specifications

Bonded Phase	Pore Size	Temp Limits*	pH Range	Endcapped
Poroshell 300SB-C18, C8, C3	300Å	90 °C	1.0-8.0	No
Poroshell 300Extend-C18	300Å	40 °C above pH 8 60 °C below pH 8	2.0-11.0	Yes

Specifications represent typical values only

*300StableBond columns are designed for optimal use at low pH. At pH 6 to 8, the 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 to 0.02 M. At mid or high pH, 300Extend-C18 is recommended.

Poroshell 300 columns separate proteins and peptides in seconds

Column: **Poroshell 300SB-C18**
660750-902
2.1 x 75 mm, 5 µm

Mobile Phase: A: 0.1% TFA in H_2O
B: 0.07% TFA in ACN

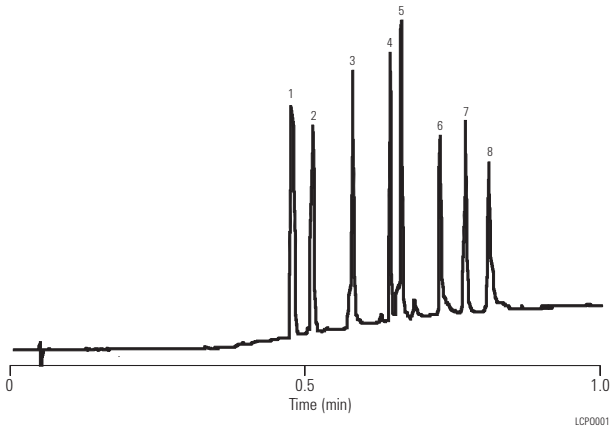
Flow Rate: 3.0 mL/min

Gradient: 5-100% B in 1.0 min

Temperature: 70 °C, 260 bar

Detector: UV, 215 nm

Sample: Proteins and peptides



1. Angiotensin II
2. Neurotensin
3. RNase
4. Insulin
5. Lysozyme
6. Myoglobin
7. Carbonic anhydrase
8. Ovalbumin

This separation of eight polypeptides and proteins is completed in less than 60 seconds. Each peak is sharp and efficient.

Poroshell 300

Hardware	Description	Size (mm)	Particle Size (µm)	Poroshell 300SB-C18	Poroshell 300SB-C8	Poroshell 300SB-C3	Poroshell 300Extend-C18
	Narrow Bore	2.1 x 75	5	660750-902	660750-906	660750-909	670750-902
	MicroBore	1.0 x 75	5	661750-902	661750-906	661750-909	671750-902
	Capillary	0.5 x 75	5		5065-4468		
ZGC	Guard Cartridge, 4/pk	2.1 x 12.5	5	821075-920	821075-918	821075-924	
ZGC	Guard Hardware Kit			820999-901	820999-901	820999-901	
	MicroBore Guard, 3/pk	1.0 x 17	5	5185-5968	5185-5968	5185-5968	5185-5968

AdvanceBio Peptide Mapping

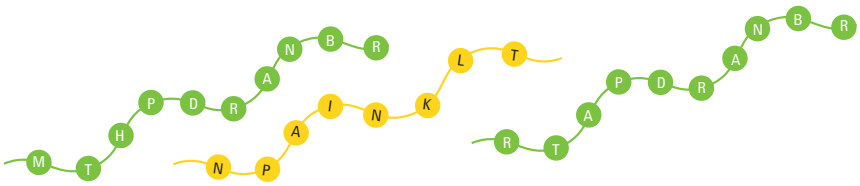
- Greater analytical confidence: Each batch of AdvanceBio Peptide Mapping media is tested with a rigorous peptide mix to ensure suitability and reproducibility, and to enable the identification of key peptides in complex peptide maps
- Save time: 2 to 3 times faster than fully porous HPLC columns
- Every instrument works harder: 4.6, 3.0, and 2.1 mm id columns are stable to 600 bar, and deliver excellent performance on 400 bar systems.
- Increased flexibility: Achieve increased MS sensitivity with formic acid mobile phases on any HPLC

These advanced biocolumns feature a 120Å pore size with superficially porous 2.7 µm particles. They are specially tested with a challenging peptides mix to ensure reliable peptide mapping performance. In addition, AdvanceBio Peptide Mapping columns deliver excellent results for conventional HPLC instruments such as Waters Alliance.

Column Specifications

Bonded Phase	Pore Size	Temp Limits	pH Range	Endcapped
EC-C18	120Å	60 °C	2.0-8.0	Double

Specifications represent typical values only



TIPS & TOOLS

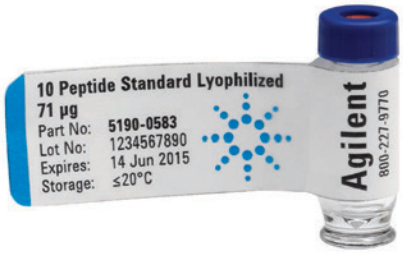
Do you want to know how scientists are using the AdvanceBio Peptide Mapping column? Refer to: Amano, M. *et al.* Detection of Histidine Oxidation in a Monoclonal Immunoglobulin Gamma (Igg) 1 Antibody. *Analytical Chemistry*, 2014, 86 (15): 7536-7543.

Leah G. Luna and Katherine Coady. Identification of X. *laevis* Vitellogenin Peptide Biomarkers for Quantification by Liquid Chromatography Tandem Mass Spectrometry. *J. Anal Bioanal Tech*, 2014, 5:3.

AdvanceBio Peptide Mapping

Description	Part No.
4.6 x 150 mm, 2.7 µm	653950-902
3.0 x 150 mm, 2.7 µm	653950-302
2.1 x 250 mm, 2.7 µm	651750-902
2.1 x 150 mm, 2.7 µm	653750-902
2.1 x 100 mm, 2.7 µm	655750-902
4.6 x 5 mm, Fast Guard*	850750-911
3.0 x 5 mm, Fast Guard*	853750-911
2.1 x 5 mm, Fast Guard*	851725-911

*Fast guards extend column lifetime without slowing down the separation or affecting resolution.



Agilent Peptide Quality Control Standard

Use the Agilent ten-peptide quality control standard, the same standard Agilent uses to QC its columns, to evaluate your column performance over its lifetime. It can be used for HPLC or LC/MS. Approximately 20 injections per vial.

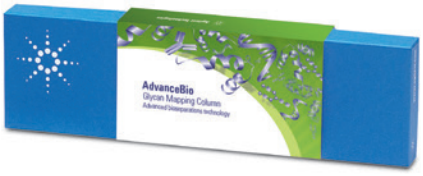
Agilent Peptide Quality Control Standard

Description	Part No.
Peptide quality control standard, 71 µg in 2 mL vial	5190-0583

TIPS & TOOLS

Peptide mapping is a powerful technique and the most widely used identity test for proteins, particularly those produced by recombinant means. There are several considerations to be made in addition to column selection for reproducible and accurate peptide maps, including protein digestion, sample prep, method optimization, and so on. For fundamental techniques used for peptide mapping procedures and emphasized considerations for optimizing your peptide mapping separations to achieve the best possible results, see: *Keys for Enabling Optimum Peptide Characterizations: A Peptide Mapping "How to" Guide* (publication 5991-2348EN)

www.agilent.com/chem/library



GLYCOSYLATION CHARACTERIZATION

Posttranslational modifications to the primary amino acid sequence, including glycosylation, have functional consequences and can impact efficacy and immunogenicity of a biopharmaceutical. The structure of the glycan also contributes to the half-life of the protein in plasma and the ability of the monoclonal antibody to trigger the immune response required for efficacy. Regulatory authorities consider glycosylation to be one of the critical quality attributes and, therefore, it must be characterized and quantified, with acceptable ranges determined, as part of the development process for a glycoprotein innovator, biosimilar, or biobetter pharmaceutical.

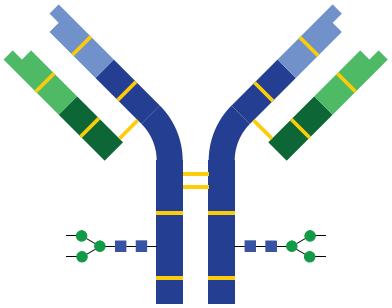
There are a number of analytical methods used to obtain information about the structure and form of protein glycosylation.

- For structural identification, including identification of glycosylation sites, mass spec detection is used with reversed-phase and hydrophilic interaction liquid chromatography (HILIC).
- Glycans containing sialic acid will also impart additional charge to the protein and can be characterized by ion-exchange chromatography.

Having characterized the glycoprotein and glycopeptide fragments to obtain information about the number and position of the glycosylation sites, it is then necessary to identify and quantify the individual glycans. To do this the glycans must be cleaved from the protein and analyzed using HILIC columns. As glycans have no chromaphore, derivatization with a fluorophore is carried out to enable FLD detection to map and quantify the glycans.

Hydrophilic Interaction Column Selection

Application	Agilent Columns	Notes
Glycans cleaved from a glycoprotein including monoclonal antibodies	AdvanceBio Glycan Mapping	Amide bonded phase for rapid equilibration and enhanced selectivity for glycans
	2.7 µm	Based on Poroshell technology to give a superficially porous particle with reduced diffusion distances to give high resolution separations at lower pressures and enable the use of longer column lengths for increased separation efficiency
Hydrophilic peptides and glycopeptides	AdvanceBio Glycan Mapping	The amide bonded phase provides an alternative HILIC functionality for small hydrophilic and glycopeptides



N-Glycan Analysis

AdvanceBio Glycan Mapping columns, standards, and sample preparation products for the selective removal of the N-glycans from a glycoprotein, including monoclonal antibodies.

- **Resolution**—high resolution separations are achieved using 2.7 µm particles packed in the 250 mm column. This increased resolution enables accurate quantitation of target glycans and changes to the protein glycosylation profile that may have occurred during expression.
- **Comprehensive methods**—for sample preparation, chromatographic analysis, and data interpretations to ensure reproducibility, and accuracy of identification and quantitation.
- **Simplicity of ordering**—a single part number to order the full sample preparation workflow, for protein solubilization to purification, of the 2-AB labeled glycans, plus kits for each part of the sample preparation workflow for versatility.

Column Specifications

Bonded Phase	ID (mm)	Particle Size (µm)	Endcapped	pH Stability	Operating Temperature	Pressure Limit
Amide HILIC	2.1 and 4.6	2.7, superficially porous	No	2-7	60 °C	600 bar

The mapping of the N-linked glycan component of a glycoprotein, including monoclonal antibodies, requires the N-glycans to be enzymatically cleaved, using PNGase F, from the protein amino acid backbone. The cleaved N-glycans can be analyzed by hydrophilic interaction chromatography with MS detection, or after derivatization with a fluorophore, 2-aminobenzamide (2-AB), analyzed using HPLC/UHPLC using either FLD or MS.

OLIGONUCLEOTIDES

The need for resolution and lifetime

Successful ion-pair reversed-phase separation of the trityl-off, deprotected oligos requires columns that have high resolving power and are robust enough to withstand the relatively aggressive analysis conditions.

Without sufficient resolution, the accuracy and precision of measurements can be compromised, leading to a lack in confidence in the analytical results.

Columns that are not robust will have a short lifetime, resulting in frequent replacement with the related disruption to workflows and increased costs.

Agilent AdvanceBio Oligonucleotide columns feature high efficiency, 2.7 µm superficially porous Poroshell particles. The particles are chemically modifi ed using proprietary technology that makes them very resistant to high pH mobile phases. They are bonded with an endcapped C18 phase that delivers excellent selectivity for oligonucleotides.

To ensure performance for your separations every batch of AdvanceBio Oligonucleotide media is tested with an Agilent Oligonucleotide Resolution standard.

Poroshell 2.7 µm particles with high pH resistance and C18 endcapping provide high-resolution separations of oligonucleotides with long column lifetime on HPLC and UHPLC systems to improve reliability of results and reduce costs.

Column Specifications

Bonded Phase	Pore Size	Temp Limits	pH Range	Endcapped
C18	100Å	65 °C	3.0-11.0	Double

Agilent innovation: The first high-pH stable superficially porous particle based LC column for oligonucleotide analysis

Oligonucleotide separations using triethylammonium acetate (TEAA)

Unmodified silica particles are prone to dissolution in basic mobile phases, leading to reduced column lifetimes. AdvanceBio Oligonucleotide columns have excellent stability with a high pH TEAA-containing mobile phase.

Column: **AdvanceBio Oligonucleotide 659750-702 2.1 x 50 mm**

Mobile Phase: A: 100 mM TEAA in water
B: 100 mM TEAA in acetonitrile

Flow Rate: 0.69 mL/min

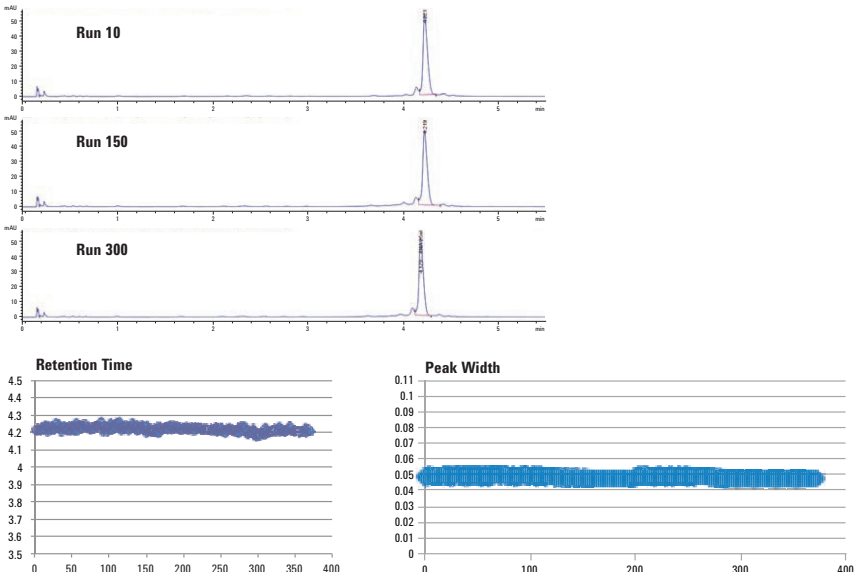
Gradient: 7% B to 11% B in 5 min
11% B to 80% B in 5.01 min
Hold at 80% B for 5.50 min
80% B to 7% B in 5.56 min
Total run time 8.5 min

Temperature: 65 °C

Detector: UV, 260 nm

Sample: 25 mer DNA

Injection: 1 µL of 0.5 mg/mL



The ability to resolve oligonucleotides that differ by a single nucleotide is important for accurate characterization. The AdvanceBio Oligonucleotide column resolves N and N-1 for the Agilent Oligonucleotide Resolution Standard (14, 17, 20, and 21 mer).

Column: **AdvanceBio Oligonucleotide 659750-702 2.1 x 50 mm**

Mobile Phase: A: 100 mM TEAA in water
B: 100 mM TEAA in acetonitrile

Flow Rate: 0.6 mL/min

Stop Time: 13 min

Post Run: 5 min

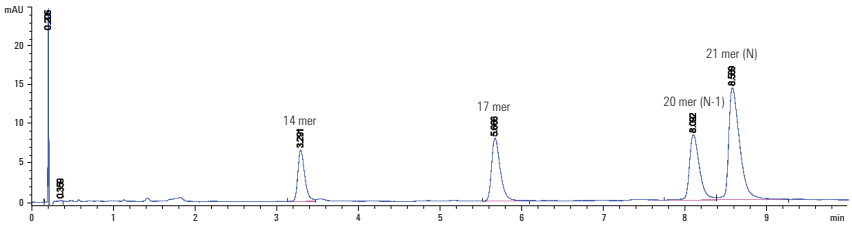
Gradient: 6 to 8% B in 12 min

Temperature: 65 °C

Detector: UV, 260 nm

Sample: Agilent Oligonucleotide Resolution Standard (p/n 5190-9028)

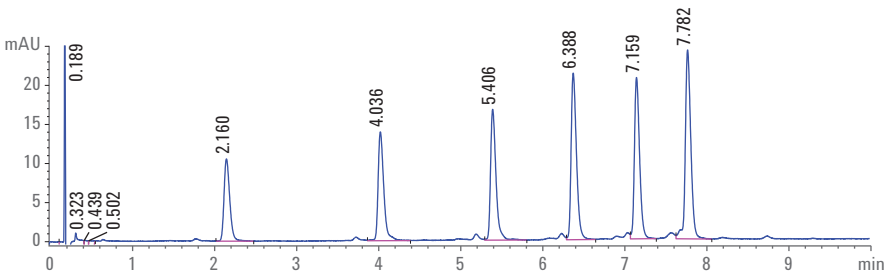
Injection: 0.5 µL



Assured Performance

Agilent also offers an Oligonucleotide Ladder standard contains 15, 20, 25, 30, 35, and 40 mer synthetic oligodeoxythymidines, an excellent tool for demonstrating column selectivity and reproducibility.

Column:	**AdvanceBio Oligonucleotide 659750-702 2.1 x 50 mm**
Mobile Phase:	A: 100 mM TEAA in water B: 100 mM TEAA in acetonitrile
Flow Rate:	0.6 mL/min
Gradient:	6 to 8% B in 12 min
Stop Time:	13 min
Post Run:	5 min
Temperature:	65 °C
Detector:	UV, 260 nm
Sample:	Agilent Oligonucleotide Resolution Standard (p/n 5190-9028)
Injection:	0.5 µL



Agilent Solutions for Oligonucleotides

Oligonucleotide Purification

Agilent PLRP-S and PL-SAX

For the purification of oligonucleotides, chemically and thermally stable polymeric HPLC media is required to achieve high purity with acceptable column lifetimes. There is no deterioration in column performance when PLRP-S columns are used at 80 °C with ion pairing agents, including TEA, for separating trityl-on from trityl-off oligos. PL-SAX 1000Å columns separate deprotected oligos under denaturing high pH conditions. The quaternary amine functionality on the polymeric particles enables ion-exchange separations at high pH, improving chromatography for self-complementary sequences.

TOP-DNA and TOP-RNA purification cartridges

Agilent TOP-DNA and TOP-RNA deliver outstanding yields of high purity synthetic DNA and RNA oligonucleotides by removing interfering salts, incomplete synthesis products and other impurities in a few simple steps. Perform detritylation of both DNA and RNA oligos in the cartridge. The 96-well format ensures that purification does not limit the throughput.

Nucleic Acid Solutions

Flexible Therapeutic Oligo Manufacturing and Development Services

The Agilent Nucleic Acid Solutions Division offers industry-leading experience to efficiently advance your lead oligo candidates from the clinic to market with a common goal of patient health and safety. Agilent has experience with all classes of oligo APIs, and supports customers from toxicology through commercialization. The Agilent GMP facility, located in Boulder, Colorado houses a broad range of synthesis and purification equipment for production of grams for toxicology and clinical research use, to tens of kilograms for late-stage clinical trials as well as commercialization.

Agilent AdvanceBio Oligonucleotide Columns and Standards

Description	Part No.
Columns	
2.1 x 50 mm, 2.7 µm	659750-702
2.1 x 100 mm, 2.7 µm	655750-702
2.1 x 150 mm, 2.7 µm	653750-702
2.1 mm Fast Guard	821725-921
4.6 x 50 mm, 2.7 µm	659950-702
4.6 x 100 mm, 2.7 µm	655950-702
4.6 x 150 mm, 2.7 µm	653950-702
4.6 mm Fast Guard	820750-921
Standards	
Oligonucleotide Resolution Standard	5190-9028
Oligonucleotide Ladder Standard	5190-9029

CHARGE VARIANT ANALYSIS

Agilent Bio mAb HPLC Columns

- A packing support composed of a rigid, spherical, highly cross-linked polystyrene divinylbenzene (PS/DVB) nonporous bead
- Particles grafted with a hydrophilic polymeric layer, virtually eliminating nonspecific binding of antibody proteins
- A different process is used to layer the weak cation-exchange phase to the particle, giving it a higher density than the Agilent Bio WCX column particles
- Specifically designed for the separation of charge isoforms of monoclonal antibodies

Thorough characterization of monoclonal antibodies includes the identification and monitoring of acidic and basic isoforms. Agilent Bio mAb HPLC columns feature a unique resin specifically designed for high resolution, charge-based separations of monoclonal antibodies. These columns are compatible with aqueous solution buffers, acetonitrile/acetone/methanol, and water mixtures. Commonly used buffers are phosphate, tris, MES, and acetate.

Bio mAb columns are available in 1.7, 3, 5, and 10 µm particle sizes, providing higher resolution with smaller particles.

Column Specifications

Bonded Phase	ID	Particle Size	pH Stability	Operating Temperature Limit	Flow Rate
Weak cation-exchange (carboxylate)	2.1 and 4.6 mm	1.7, 3, 5, and 10 µm	2-12	80 °C	0.1-1.0 mL/min

TIPS & TOOLS

Are you looking to increase your throughput for charge variant analysis of monoclonal antibodies? If so, see:

Reducing Cycle Time for Charge Variant Analysis of Monoclonal Antibodies Alternating Column Regeneration Using an Agilent 1200 Infinity Series Quick-Change Bio-inert 2-position/10-port Valve (publication 5991-4722EN)

www.agilent.com/chem/library

Virtually eliminate retention time variations

Column: **Bio mAb, stainless steel**
5190-2413
4.6 x 250 mm, 10 µm

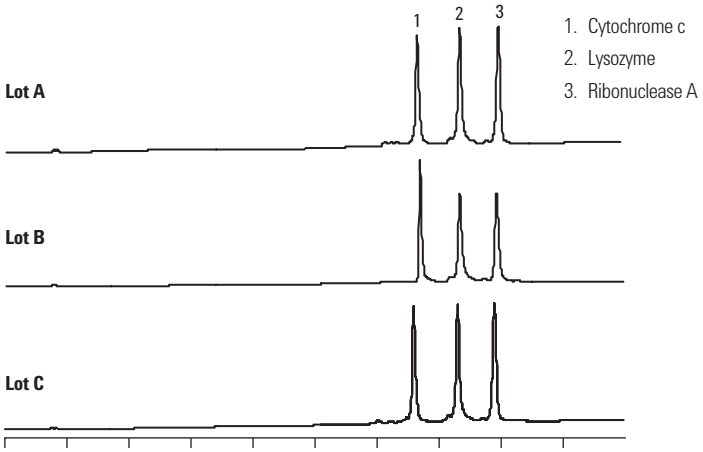
Mobile Phase: A: 10 mM sodium phosphate, pH 6.0
B: A + 1.0 M sodium chloride

Flow Rate: 1.0 mL/min

Gradient: 0-100% B in 42 min

Temperature: 25 °C

Detector: UV, 214 nm



The combination of well-controlled resin production, column surface chemistry, and column packing virtually eliminates retention time variations from column-to-column and lot-to-lot.

Agilent Bio mAb HPLC Columns

Size (mm)	Particle Size (µm)	Bio mAb PEEK	Pressure Limit	Bio mAb Stainless Steel	Pressure Limit
21.2 x 250	5			5190-6885	275 bar, 4000 psi
10 x 250	5			5190-6884	275 bar, 4000 psi
4.6 x 250	10	5190-2415	275 bar, 4000 psi	5190-2413	275 bar, 4000 psi
4.6 x 50	10	5190-2416	275 bar, 4000 psi		
4.6 x 250	5	5190-2407	400 bar, 5800 psi	5190-2405	400 bar, 5800 psi
4.6 x 50	5	5190-2408	400 bar, 5800 psi		
4.6 x 50	3			5190-2403	551 bar, 8000 psi
4.6 x 50	1.7			5190-2401	600 bar, 8700 psi
4.0 x 10, Guard	10			5190-2414	275 bar, 4000 psi
4.0 x 10, Guard	5			5190-2406	413 bar, 6000 psi
4.0 x 10, Guard	3			5190-2404	551 bar, 8000 psi
4.0 x 10, Guard	1.7			5190-2402	600 bar, 8700 psi
2.1 x 250	10	5190-2419	275 bar, 4000 psi		
2.1 x 50	10	5190-2420	275 bar, 4000 psi		
2.1 x 250	5	5190-2411	400 bar, 5800 psi		
2.1 x 50	5	5190-2412	400 bar, 5800 psi		

Agilent Bio IEX HPLC Columns

- Highly cross-linked and rigid nonporous poly(styrene divinylbenzene) (PS/DVB) particles are grafted with a hydrophilic polymeric layer, eliminating nonspecific binding
- Uniform, densely packed ion-exchange functional groups are chemically bonded to the hydrophilic layer (multiple ion-exchange groups per anchor) to increase column capacity
- Particles, coating, and bonding are resistant to high pressures, promoting higher resolution and faster separations
- Multiple ion-exchange groups are captured on one anchor to increase capacity

Agilent Bio IEX HPLC columns are packed with polymeric, nonporous, ion-exchange particles and are designed for high resolution, high recovery, and highly efficient separations of peptides, oligonucleotides, and proteins.

The Bio IEX family includes strong cation-exchange (SCX), weak cation-exchange (WCX), strong anion-exchange (SAX), and weak anion-exchange (WAX) phases. All phases are available in 1.7, 3, 5, and 10 µm nonporous particles.

Column Specifications

Bonded Phase	ID (mm)	Particle Size (µm)	pH Stability	Operating Temperature Limit	Flow Rate
SCX (strong cation-exchange)—SO_3H	2.1 and 4.6	1.7, 3, 5, and 10	2-12	80 °C	0.1-1.0 mL/min
WCX (weak cation-exchange)—COOH					
SAX (strong anion-exchange)—$N(CH_3)_3$					
WAX (weak anion-exchange)—$N(C_2H_5)_2$					

TIPS & TOOLS

For further information on optimizing your charge variant analysis, see:

Ion-exchange chromatography for biomolecule analysis: a "how-to" guide (publication 5991-3775EN), and

Agilent ion-exchange BioHPLC columns, characterize charged variants of proteins with speed and confidence (publication 5991-2449EN)

www.agilent.com/chem/library

PL-SAX Strong Anion-Exchange Columns

- Small particles deliver excellent chromatographic performance
- Wide range of particle sizes and two pore sizes for flexible analysis to scale up purification
- Exceptional stability for long column lifetime

PL-SAX -$N(CH_3)_3^+$ is ideal for the anion-exchange HPLC separations of proteins, peptides, and deprotected synthetic oligonucleotides under denaturing conditions. The strong anion-exchange functionality, covalently linked to a chemically stable fully porous polymer, extends the operating pH range. In addition, the anion-exchange capacity is independent of pH. For synthetic oligonucleotides, separations using denaturing conditions of temperature, organic solvent, and high pH are all possible. PL-SAX delivers improved chromatography for self-complementary or G-rich sequences that may associate to form aggregates or hairpin structures. The 5 µm material provides high efficiency separations of n and n-1 sequences. A wide range of particle sizes and column geometries permits analysis scale-up to purification. The strong anion-exchange functionality provides a material with exceptional chemical and thermal stability, even with sodium hydroxide eluents, leading to long column lifetime.

Column Specifications

Bonded Phase	ID	Particle Size	Pore Size	pH Stability	Operating Temperature Limit
Strong anion-exchange	2.1, 4.6, 7.5, 25, 50, and 100	5, 8, 10, and 30	1000Å and 4000Å	1-14	80 °C

AGGREGATION ANALYSIS

Agilent Bio SEC-3 Columns

Agilent Bio SEC-3 columns offer speed and resolution advantages over other SEC columns, thanks to their small, efficient particles.

- Faster separations than large-particle SEC columns
- High resolution: Sharper peaks and better protein recovery
- Exceptional loading capacity and recovery due to proprietary hydrophilic layer
- Flexible method development: Compatible with most aqueous buffers
- Excellent stability under both high- and low-salt conditions
- Reliable, consistent performance: narrowly dispersed particles; proprietary hydrophilic layer provides for minimal secondary interactions
- Robust particles compatible with multi-detectors including light scattering

With higher resolution for faster peptide and protein separations, Bio SEC-3 columns help you achieve more consistent SEC separations. Each column is packed with spherical, narrowly dispersed 3 µm silica particles coated with a proprietary hydrophilic layer for high recovery and minimal secondary interactions, which provides more consistent separations. This thin polymeric layer is chemically bonded to pure, mechanically stable silica under controlled conditions, ensuring a highly efficient and stable size exclusion particle.

TIPS & TOOLS

Deactivated/silanized vials have inert surfaces that will not interact with metals, biologicals, or proteins, and will not cause pH shifts. Avoid standard polypropylene vials for biological or light-sensitive compounds.

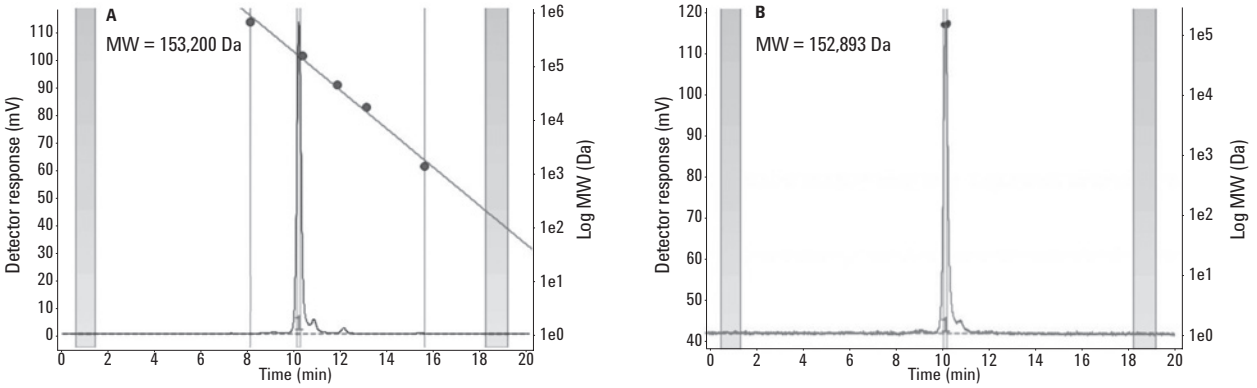
Column Specifications

Pore Size	Particle Size (µm)	MW Range	pH Range	Max Pressure	Flow Rate
100Å	3	100-100,000	2-8.5	137 bar, 2000 psi	1.0-10.0 mL/min (21.2 mm id)
					0.2-1.2 mL/min (7.8 mm id)
					0.1-0.4 mL/min (4.6 mm id)
150Å	3	500-150,000	2-8.5	137 bar, 2000 psi	1.0-10.0 mL/min (21.2 mm id)
					0.2-1.2 mL/min (7.8 mm id)
					0.1-0.4 mL/min (4.6 mm id)
300Å	3	5,000-1,250,000	2-8.5	137 bar, 2000 psi	1.0-10.0 mL/min (21.2 mm id)
					0.2-1.2 mL/min (7.8 mm id)
					0.1-0.4 mL/min (4.6 mm id)

Comparison of traditional SEC analysis

Column: **Bio SEC-3, 300Å**
5190-2511
7.8 x 300 mm, 3 µm

Mobile Phase: PBS, pH 7.4
Flow Rate: 0.75 mL/min



Comparison of traditional SEC analysis with UV detection and column calibration (A) and LS analysis at 90° (B) for anti-DYKDDDDK. Both MW results lie in the same range of approximately 153,000 Da.

Advance Bio SEC-3

Size (mm)	Particle Size (µm)	Bio SEC-3 100Å USP L33	Bio SEC-3 150Å USP L33	Bio SEC-3 300Å USP L33
21.2 x 300	3	5190-6850	5190-6851	5190-6852
21.2 x 50, Guard	3	5190-6854	5190-6855	5190-6856
7.8 x 300	3	5190-2501	5190-2506	5190-2511
7.8 x 150	3	5190-2502	5190-2507	5190-2512
7.8 x 50, Guard	3	5190-2505	5190-2510	5190-2515
4.6 x 300	3	5190-2503	5190-2508	5190-2513
4.6 x 150	3	5190-2504	5190-2509	5190-2514
4.6 x 50, Guard	3	5190-6846	5190-6847	5190-6848

TIPS & TOOLS

To further understand molecular weight determination and aggregation analysis using Agilent BioSEC-3 columns, see:

Agilent BioHPLC Size Exclusion Chromatography Columns brochure (publication 5991-2898EN).

www.agilent.com/chem/library

Agilent Bio SEC-5 Columns

- 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

For large biomolecules and samples with components of multiple molecular weights, Agilent Bio SEC-5 columns are an ideal choice. They are packed with 5 µm silica particles coated with a proprietary, neutral, hydrophilic layer for maximum efficiency and stability, with six different pore sizes to provide optimum resolution over the molecular weight range.

TIPS & TOOLS

Deactivated/silanized vials have inert surfaces that will not interact with metals, biologicals or proteins, and will not cause pH shifts. Avoid standard polypropylene vials for biological or light-sensitive compounds.

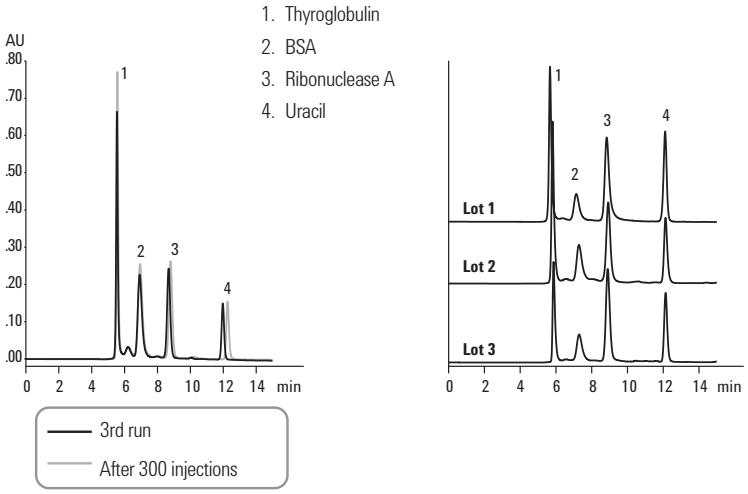
Column Specifications

Pore Size	Particle Size (µm)	MW Range	pH Range	Max Pressure	Flow Rate
100Å	5	100-100,000	2-8.5	137 bar, 2000 psi	1.0-10.0 mL/min (21.2 mm id)
					0.2-1.2 mL/min (7.8 mm id)
					0.1-0.4 mL/min (4.6 mm id)
150Å	5	500-150,000	2-8.5	137 bar, 2000 psi	1.0-10.0 mL/min (21.2 mm id)
					0.2-1.2 mL/min (7.8 mm id)
					0.1-0.4 mL/min (4.6 mm id)
300Å	5	5,000-1,250,000	2-8.5	137 bar, 2000 psi	1.0-10.0 mL/min (21.2 mm id)
					0.2-1.2 mL/min (7.8 mm id)
					0.1-0.4 mL/min (4.6 mm id)
500Å	5	15,000-5,000,000	2-8.5	137 bar, 2000 psi	1.0-10.0 mL/min (21.2 mm id)
					0.2-1.2 mL/min (7.8 mm id)
					0.1-0.4 mL/min (4.6 mm id)
1000Å	5	50,000-7,500,000	2-8.5	137 bar, 2000 psi	1.0-10.0 mL/min (21.2 mm id)
					0.2-1.2 mL/min (7.8 mm id)
					0.1-0.4 mL/min (4.6 mm id)
2000Å	5	>10,000,000	2-8.5	137 bar, 2000 psi	1.0-10.0 mL/min (21.2 mm id)
					0.2-1.2 mL/min (7.8 mm id)
					0.1-0.4 mL/min (4.6 mm id)

Exceptional lot-to-lot reproducibility

Column: **Bio SEC-5, 150Å**
5190-2521
7.8 x 300 mm, 5 µm

Mobile Phase: Sodium phosphate 150 mM, pH 7.0



The four-protein mixture shows excellent retention time reproducibility over 300 injections and on three columns from different manufacturing lots.

Advance Bio SEC-5

Size (mm)	Particle Size (µm)	Bio SEC-5 100Å USP L33	Bio SEC-5 150Å USP L33	Bio SEC-5 300Å USP L33	Bio SEC-5 500Å USP L33	Bio SEC-5 1000Å USP L33	Bio SEC-5 2000Å USP L33
21.2 x 300	5	5190-6863	5190-6864	5190-6865	5190-6866	5190-6867	5190-6868
21.2 x 50, Guard	5	5190-6869	5190-6870	5190-6871	5190-6872	5190-6873	5190-6874
7.8 x 300	5	5190-2516	5190-2521	5190-2526	5190-2531	5190-2536	5190-2541
7.8 x 150	5	5190-2517	5190-2522	5190-2527	5190-2532	5190-2537	5190-2542
7.8 x 50, Guard	5	5190-2520	5190-2525	5190-2530	5190-2535	5190-2540	5190-2545
4.6 x 300	5	5190-2518	5190-2523	5190-2528	5190-2533	5190-2538	5190-2543
4.6 x 150	5	5190-2519	5190-2524	5190-2529	5190-2534	5190-2539	5190-2544
4.6 x 50, Guard	5	5190-6857	5190-6858	5190-6859	5190-6860	5190-6861	5190-6862

Bio-Monolith Protein A Column, 5069-3639

TITER DETERMINATION

Affinity chromatography is a powerful technique that takes advantage of highly specific molecular interactions, frequently between specific proteins (e.g. antigen/antibody). Agilent offers several specialty affinity products; a monolithic Protein A column for the isolation and quantitation of IgG and a series of Multiple Affinity Removal Systems for the elimination of high abundance proteins in biological samples.

Agilent Bio-Monolith Protein A HPLC Columns

- Designed for the analytical separation of all IgG (human and mouse), except for IgG class 3
- Separations independent of flow rate; no diffusion, no pores, and no void volume make transport between mobile and stationary phase very rapid
- Extremely fast separations speed up method development time and decrease costs
- Locking in method parameters takes significantly less time and buffer

Agilent Bio-Monolith Protein A HPLC columns are part of the Agilent Bio-Monolith column family. Protein A Bio-Monolith columns are compatible with Waters HPLC and preparative LC systems

TIPS & TOOLS

For more information on salt tolerance for mAb binding and acidic buffers compatability for mAb elution on Agilent Bio-Monolith Protein A columns, see: *Agilent Bio-Monolith Protein A Monitors Monoclonal Antibody Titer from Cell Cultures* (publication 5991-2990EN)

www.agilent.com/chem/library

Column Specifications	
Dimensions	5.2 mm x 4.95 mm
Column volume	100 µL
Maximum pressure	150 bar (15 MPa, 2,200 psi)
Temperature min/max	Operating: 2-40 °C
	Storage: 2-8 °C
Recommended pH	Operating range: 2-13
	Cleaning-in-place: 1-14
Materials of construction	Hardware: stainless steel
	Packing: poly(glycidyl methacrylate-co-ethylene dimethacrylate) highly porous monolith
Color ring identifier	Bio-Monolith Protein A: white
Shelf life/expiration date	Protein A: 12 months

Bio-Monolith Protein A

Column	Description	Key Applications	Part No.
Bio-Monolith Protein A	The Protein A affinity column is designed for the analytical separation of IgG1 and IgG2 (human and mouse).	Quantitative determination of IgG (fermentation titer calculation)	5069-3639

TIPS & TOOLS

Further information can be found in:

mAb Titer Analysis with the Agilent Bio-Monolith Protein A Column (publication 5991-5135EN)

Agilent Bio-Monolith Protein A Monitors Monoclonal Antibody Titer from Cell Cultures (publication 5991-2990EN)

Cell Clone Selection Using the Agilent Bio-Monoltih Protein A Column and LC/MS (publication 5991-5124EN)

Cell Culture Optimization Using an Agilent Bio-Monolith Protein A Column and LC/MS (publication 5991-5125EN)

www.agilent.com/chem/library

VIALS AND CLOSURES

Agilent vials and closures are thoroughly tested to ensure the highest level of quality. Additionally, Agilent vials are designed for use in a wide range of Waters LCs.

- Manufactured in an ISO 9001 certified facility
- Made from First Hydrolytic Type 1 Class A or Class B borosilicate glass, which conforms to US FDA, USP, and EU Pharmacopeia standards
- Protected by proprietary packaging with a crush barrier to reduce vial breakage
- Packaged in material that has been tested and selected for cleanliness
- Subjected to rigorous end-of-line sampling and quality control procedures to ensure all vials remain within specifications
- Compatible with a wide variety of autosamplers regardless of make and model

Vials for Waters

Similar to Waters Part No.	Part No.
186001421	8010-0565
186001422	8010-0564
186000307C	8010-0542
186000838C	8010-0553
186000847C	8010-0543
1860 01133C	8010-0554

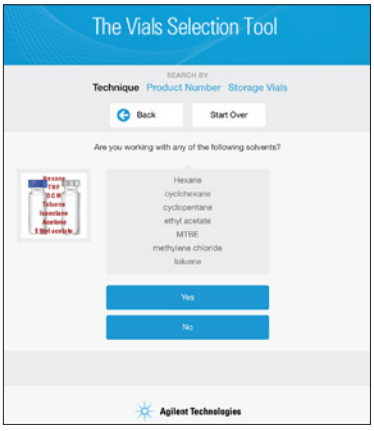
The table below illustrates that the Agilent vial portfolio is compatible with a wide range of Waters autosamplers.

Vial Compatibility Chart

Autosampler	8 mm Screw Top	9 mm Screw Top	15 x 45 mm, 4 mL	11 mm Crimp Top
717 Plus				✓
ACQUITY	✓	✓		✓
Alliance 2690	✓	✓		
CapLC	✓	✓		✓
WISP			✓	

TIPS & TOOLS

Let the experts in chromatography help you select the right vials and closures for your application. Select your vial at **www.selectvials.chem.agilent.com**



Vial Septum Chemical Compatibility Chart

	PTFE	PTFE/Silicone	PTFE/ Silicone/PTFE*	PTFE/Red Rubber	Viton	PTFE/Butyl
Acetonitrile	✓	✓	✓	✓		✓
Hydrocarbons (hexane, heptane, methane)	✓		✓	✓	✓	
Methanol	✓	✓	✓	✓		✓
Benzene	✓		✓		✓	
THF	✓		✓			
Toluene	✓		✓			
DMF	✓	✓	✓			✓
DMSO	✓	✓	✓			✓
Ether	✓	✓	✓			
Chlorinated solvents (methylene chloride)	✓		✓		✓	
Alcohols (ethanol)	✓	✓	✓	✓	✓	✓
Acetic acid	✓	✓	✓			✓
Acetone	✓	✓	✓			
Phenol	✓	✓	✓		✓	✓
Cyclohexane	✓		✓	✓	✓	

*PTFE/silicone/PTFE has the same chemical compatibility of PTFE ONLY UNTIL PUNCTURED

Agilent provides this septa compatibility information as a guide and starting reference point. We realize that chemical compatibility can vary depending on the concentration of the solvent, temperature, molecular weight of the solvent, and other factors. Therefore, we recommend that you try a variety of septa to determine the best one for your analysis.

Vial Cap and Septum Compatibility Chart

	Thin PTFE	PTFE/ Silicone*	PTFE/ Silicone/PTFE*	PTFE/ Red Rubber	Viton	Butyl	High Performance Septa
Temperature Range	Up to 260 °C	-40 °C to 200 °C	-40 °C to 200 °C	-40 °C to 90 °C	-40 °C to 260 °C	-50 °C to 150 °C	Up to 300 °C for up to 1 hour
Use for multiple injections	No	Yes	Yes	No	No	No	Yes
Price	Very economical	Economical	Most expensive	Very economical	Economical	Economical	More expensive
Resistance to coring	None	Excellent	Excellent	None	None	None	Excellent
Recommended for storage	No	Yes	Yes	No	No	No	No
Best for	Superior chemical inertness, short cycle times, and single injections	Most common HPLC and GC analyses, not as resistant to coring as P/S/P	Superior performance for ultra trace analysis, repeat injections, internal standards	Chlorosilanes, more economical option for single injections	Chlorinated solvents, higher temperatures	Organic solvents, acetic acids; impermeable to gases	High temperature headspace applications

*Agilent silicone is platinum cured (versus peroxide cured), making it more inert and less likely to interact with samples

To obtain an optimal fit and seal of any vial and closure, we strongly recommend buying an entire vial assembly (including a vial, cap, and septum, as well as a vial insert if needed). Please avoid mixing and matching any vials with any other brand of closures, or any closures with any other brand of vials.

AUTOSAMPLER SYRINGES

Autosampler Syringes

Model	Volume (µL)	Description	Needle Gauge/ Length (mm)/ Tip	Similar to Waters Part No.	Syringe Part No.	Replacement Needle Part No.	Similar to Waters Part No.	Replacement Plunger Part No.
2777 Compact Sample Manager 2777 Sample Manager	10	Fixed needle	22s/51/3	430000859	8010-0445*		700002212	8010-0457, 10/pk
	25	Fixed needle, gas tight	22s/51/3	430000861	8010-0441		700002213	8010-0458, 10/pk
	100	Fixed needle, gas tight	22s/51/3	430000864	8010-0442*		700002214	8010-0459, 10/pk
		Fixed needle, gas tight	22s/51/3	430000863	8010-0446*		700002214	8010-0459, 10/pk
	250	Fixed needle, gas tight	22s/51/3	430000865	8010-0467		700002215	8010-0456, 10/pk
	500	Fixed needle, gas tight	22s/51/3	430000866	8010-0468		700002216	8010-0460, 10/pk
	1,000	Fixed needle, gas tight	22s/51/3	430000867	8010-0443		700002217	8010-0455, 10/pk
	2,500	Fixed needle, gas tight	22s/51/3	430000868	8010-0444		700002218	8010-0448, 1/pk
510 HPLC Pump 515 HPLC Pump 600 MultiSolvent Delivery System CapLC System CapLC XE System	10,000	Luer Lock	No needle	WAT025559	8005-0414			

*Barrel od is 6.7 mm. All other 10, 25, and, 100 µL syringes have 7.9 mm od.

(Continued)

The cross references to the Waters part numbers listed here serve as a recommendation that the Agilent products are viable alternatives to Waters products. Agilent products are compatible with the corresponding Waters instruments, although in some cases, the Agilent products may have slightly different designs as compared to the Waters counterparts. All Agilent supplies are backed by the Agilent 90-day money-back warranty.

Autosampler syringe, 100 µL fixed needle, 8010-0442

Autosampler Syringes, 1/pk

Model	Volume (µL)	Description	Needle Gauge/ Length (mm)/ Tip	Similar to Waters Part No.	Syringe Part No.	Replacement Needle Part No.	Similar to Waters Part No.	Replacement Plunger Part No.
600 MultiSolvent Delivery System Rheodyne Injector	25	Removable needle, gas tight	22s/51/3	WAT033381	8005-0416			8005-0422
2690 Separations Module 2690D Dissolution Separations Module 2695 Separations Module 2695D Dissolution Separations Module	25	Chem (1/4-28 UNF screw threads), gas tight	No needle	WAT077343	8005-0420			
2790 Separations Module 2795 Separations Module LC Module 1 717/717plus Autosampler	250	Chem (1/4-28 UNF screw threads), gas tight	No needle	WAT073109	8005-0419			
Rheodyne Injector	100	Removable needle, gas tight	22s/51/3	WAT033383	8005-0417	8005-0418, 6/pk		8005-0423

The cross references to the Waters part numbers listed here serve as a recommendation that the Agilent products are viable alternatives to Waters products. Agilent products are compatible with the corresponding Waters instruments, although in some cases, the Agilent products may have slightly different designs as compared to the Waters counterparts. All Agilent supplies are backed by the Agilent 90-day money-back warranty.

SAMPLE PREPARATION

Reliably extract and concentrate samples from complex matrices

Sample preparation is an essential part of successful chromatography. It extends column lifetime, reduces the need for repeated samples, and minimizes interferences that can jeopardize your separation, detection, and quantification.

Agilent offers the most complete line of sample prep products across the full spectrum of instrumentation. These include:

- **Bond Elut SPE products**—selectively remove interferences and/or analytes from challenging matrices. They feature trifunctional bonding chemistry for greater stability—plus a three-tier QC process that confirms the correct particle size. Choose from the largest selection of sorbent formats in the market today.
- **Pre-packaged QuEChERS kits**—make sample preparation faster, easier, and more reliable. Options include extraction kits with pre-weighted salts in anhydrous packets, dispersive kits that accommodate aliquot volumes specified by AOAC/EN methods, and ceramic homogenizers that promote consistent extraction and recovery.
- **Enhanced Matrix Removal**—Lipid is a unique sorbent that selectively removes lipids in complex matrices and challenging high-fat samples. You can effectively remove lipids interfaces without losing your analytes, improving data quality and confidence in your results.
- **Filtration products** improve both system performance and analytical quality and prevent extractables or other contaminants from damaging the integrity of your samples. Choose from the industry's widest variety of membrane types and pore sizes to suit your applications.

Typical Matrices

Plasma, urine, biological fluids, and aqueous samples

Primary Extraction Mechanism

Non-polar

Bond Elut Plexa Polymeric SPE

Bond Elut Plexa is a family 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

Bond Elut Plexa is a nonpolar divinylbenzene-based neutral polymeric sorbent. This sorbent is the best choice for nonionic extraction of a wide range of acidic, neutral, and basic analytes from different matrices.

Bond Elut Plexa PCX

Bond Elut Plexa PCX is a cation exchanger with mixed-mode sorbent characteristics and is therefore suitable for the extraction and cleanup of weak bases from biofluids. Bond Elut Plexa PCX demonstrates the same excellent particle size distribution and integrity as Bond Elut Plexa. A highly controlled sulfonation process results in zero fines for Bond Elut Plexa PCX.

Bond Elut Plexa PAX

Bond Elut Plexa PAX is an anion exchanger based on the same innovative base polymer particle technology as the other members of the Plexa SPE family. This advanced material offers excellent flow characteristics due to its monodisperse particle size distribution, affording superior ease-of-use, with minimal clogging of the packed bed. The amide-free particle technology does not provide binding sites for endogenous interferences such as proteins and lipids.

TIPS & TOOLS

Tabless (flangeless) cartridges are suitable for use with many automated SPE systems. Tabless products are typically designated with a "T" in the part number. If you need a tabless cartridge and do not see a part number listed, please contact your nearest Agilent office or Agilent Representative to discuss custom options.

Bond Elut Plexa

Description	Unit	Part No.
Straight Barrel Cartridges		
30 mg, 1 mL	100/pk	12109301
30 mg, 1 mL, tabless	100/pk	12109301T
30 mg, 3 mL	50/pk	12109303
60 mg, 1 mL	100/pk	12109601
60 mg, 3 mL	50/pk	12109603
200 mg, 3 mL	50/pk	12109610
200 mg, 6 mL	30/pk	12109206
500 mg, 3 mL	30/pk	12109703
500 mg, 6 mL	30/pk	12259506
Bond Elut Jr		
200 mg	50/pk	12169610B
Mega Bond Elut Plexa		
500 mg, 12 mL	20/pk	327832
Other Formats		
Bond Elut Plexa Prospekt cartridge, 2 mm	96/pk	12221305
Bond Elut Plexa 800 Series cartridge	96/pk	12281305
Gerstel, 60 mg, 3 mL	50/pk	167816G
Gerstel, 200 mg, 3 mL	50/pk	167822G

Bond Elut Plexa 96-well Plates

Description	10 mg	30 mg
Round-well, 1 mL	A4969010	A4969030
Square-well, 2 mL	A3969010	A3969030

Typical Matrices

Plasma, urine, biological fluids, and aqueous samples

Primary Extraction Mechanism

Mixed mode: non-polar and cation exchange

Bond Elut Plexa PCX

- Faster flow rates improve productivity
- Extraction cleanliness and reduced interference improve precision
- Simplified, single method for ease-of-use

Bond Elut Plexa PCX is another milestone in the development of simple and robust SPE methods. Plexa PCX uses a polymeric cation-exchange resin that combines the outstanding properties of Bond Elut Plexa—superior flow characteristics and improved analytical performance—with strong cation-exchange functionalities. This mixed-mode SPE sorbent removes neutral and acidic interferences from the matrix, concentrates basic analytes and therefore improves sensitivity in the determination of basic compounds.

The Plexa PCX particles are near monodispersed, resulting in homogenous packing. Reproducible results are the norm, with very good tube-to-tube and well-to-well performance. Ion suppression is reduced because the highly polar, hydroxylated polymer surface is entirely amide-free and does not provide binding sites for endogenous species such as proteins and lipids.

Plexa PCX comes with a simple, single method for basic drugs that offers improved recoveries, cleaner extracts, and reduced method development time and cost. Flow rate is improved because Plexa PCX particles have much narrower particle size distribution with no fines to cause blockages.

Typical Method for Bond Elut Plexa PCX

Sample:
100 µL plasma

Pretreatment:
Dilute 1:3 with 2% H_3PO_4

Conditioning:
1. 500 µL MeOH
2. 500 µL H_2O

Washes:
Acidic wash: 500 µL aqueous 2% formic acid

Neutral wash: 500 µL CH_3OH/CH_3CN (1:1, v/v)

Elution:
500 µL CH_3OH/CH_3CN + 5% NH_3 (28-30%)

Volumes stated are for Bond Elut, 96-well, 30 mg, 1 mL, p/n A4968030.

Bond Elut Plexa PCX

Description	Unit	Part No.
Straight Barrel Cartridges		
30 mg, 1 mL	100/pk	12108301
60 mg, 1 mL	100/pk	12108601
30 mg, 3 mL	50/pk	12108303
60 mg, 3 mL	50/pk	12108603
60 mg, 3 mL, tabless	50/pk	12108603T
200 mg, 6 mL	30/pk	12108206
500 mg, 6 mL	30/pk	12258506
Other Formats		
Bond Elut Plexa PCX Prospekt cartridge, 2 mm	96/pk	12221306
Bond Elut Plexa PCX 800 Series cartridge, 2 mm	96/pk	12281306
Gerstel	50/pk	168016G

Bond Elut Plexa 96-well Plates

Description	10 mg	30 mg
Round-well, 1 mL	A4968010	A4968030
Square-well, 2 mL	A3968010	A3968030

TIPS & TOOLS

View the core concepts of SPE and demonstrations of sample preparation, please visit **www.agilent.com/chem/spevideo**

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 method development time

Bond Elut Plexa PAX is a polymeric anion-exchange product (PAX) that sets the performance standard in analyte cleanup and reproducibility for polar and non-polar acidic analytes. Existing polymeric anion-exchange sorbents can exhibit a broad range of ion-exchange capacity from batch to batch, leading to method irreproducibility and compromised data. Plexa PAX particles are functionalized using a proprietary process, which allows anion exchange loadings to be controlled with a very high degree of reproducibility, giving more robust performance across the lifetime of your compound study or method.

This Plexa PAX polymeric mixed-mode SPE product comes with a simple, single method for non-polar acidic and polar acidic analytes that offers excellent clean up, even in complex matrices such as plasma. The optimized anion exchange method offers clean extracts, high recoveries, and low RSDs, reducing method development time, sample repeats, and overall cost per sample in the process.

Typical Matrices

Plasma, urine, biological fluids, and aqueous samples

Primary Extraction Mechanism

Mixed mode: non-polar and anion exchange

Typical Method for Bond Elut Plexa PAX

Sample:
100 µL human plasma

Pretreatment:
Dilute 1:3 with 2% NH_4OH

Conditioning:
1. 500 µL MeOH
2. 500 µL H_2O

Washes:
1. 500 µL H_2O
2. 500 µL MeOH

Elution:
500 µL 5% formic acid:MeOH

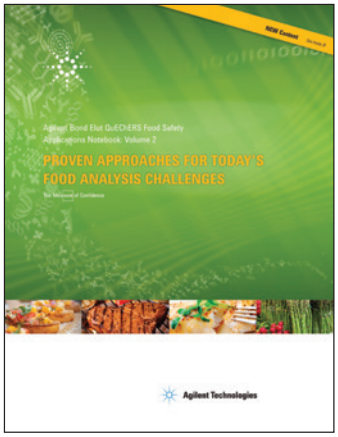
Volumes stated are for Bond Elut, 96-well, 1 mL, p/n A4967010.

Bond Elut Plexa PCX

Description	Unit	Part No.
Straight Barrel Cartridges		
30 mg, 1 mL	100/pk	12107301
60 mg, 1 mL	100/pk	12107601
30 mg, 3 mL	50/pk	12107303
60 mg, 3 mL	50/pk	12107603
200 mg, 6 mL	30/pk	12107206
500 mg, 6 mL	30/pk	12257506

Bond Elut Plexa 96-well Plates

Description	10 mg	30 mg
Round-well, 1 mL	A4967010	A4967030
Square-well, 2 mL	A3967010	A3967030



Bond Elut QuEChERS

Agilent Bond Elut QuEChERS Kits make sample prep as easy as 1- 2- 3. Prepackaged QuEChERS kits are an easy way to capture the time saving benefits of QuEChERS sample preparation.

- **Extraction kits** with pre-weighed anhydrous salts in sealed packets allow you to add salts after you add organic solvent to your sample—avoiding an exothermic reaction that can compromise analyte recovery.
- **Dispersive kits** with sorbents and salts supplied in 2 or 15 mL centrifuge tubes accommodate the aliquot volumes specified by current AOAC and EN methodologies.
- **Universal dispersive kits** provide excellent recoveries and reproducibility for all types of fruits and vegetables.
- **EMR—Lipid** selectively removes lipids and high fat samples and challenging complex matrices, providing cleaner samples and greater confidence in results.
- **Ceramic homogenizers** break up salt agglomerates, promoting consistent sample extraction and increasing product recovery during extraction and dispersion; shaking time reduced from 60 to 20 seconds.

To support the wide range of QuEChERS product options, we offer many applications featuring the QuEChERS approach. *The Agilent Bond Elut QuEChERS Food Safety Applications Notebook: Volume 2* (publication 5990-4977EN) includes many of these applications. You will find the applications grouped according to the standard method associated with the application, such as AOAC, EN, or the original method, along with a section for other approaches. A handy index also lets you search this guide based on matrix type and analyte class.

TIPS & TOOLS

Find the best QuEChERS products for your applications

Identify your ideal option by making selections based on current QuEChERS sample preparation product, matrix, or official QuEChERS method, at **www.agilent.com/chem/SelectQuEChERS**

QuEChERS AOAC 2007.01 extraction kit, 5982-5755

Ceramic homogenizer for 50 mL tubes, 5982-9313

QuEChERS Extraction Kits

Step 1: Extraction

Choose the extraction salt packet based on your method of analysis, AOAC or EN. The buffered extraction salts are amenable for more labile pesticides. Adding solvent and then salts to a comminuted fruit or vegetable sample (10 or 15 g) enables you to extract the pesticides of interest into the organic layer. Agilent pre-packages its QuEChERS salts and buffers in anhydrous packages. This allows you to add them after adding your solvent to the sample, as specified in QuEChERS methods.

In the tables below, the "CH" products contain the appropriately sized ceramic homogenizer for those particular kits.

QuEChERS Extraction Kits

Method	Buffered	Contents	Ceramic Homogenizers	With 50 mL Tubes 50/pk	Packets Only 50/pk	Packets Only 200/pk
AOAC 2007.01	Yes	6 g $MgSO_4$; 1.5 g NaAcetate	Yes	5982-5755CH		
			No	5982-5755	5982-6755	5982-7755
Original (10 g samples)	No	4 g $MgSO_4$; 1 g NaCl	Yes	5982-5550CH		
			No	5982-5550	5982-6550	5982-7550
Original (15 g samples)	No	6 g $MgSO_4$; 1.5 g NaCl	Yes	5982-5555CH		
			No	5982-5555	5982-6555	5982-7555
EN 15662	Yes	4 g $MgSO_4$; 1 g NaCl; 1 g NaCitrate; 0.5 g disodium citrate sesquihydrate	Yes	5982-5650CH		
			No	5982-5650	5982-6650	5982-7650
Acrylamides*	No	4 g $MgSO_4$; 0.5 g NaCl	No	5982-5850		
Veterinary Drugs**	No	4g $Na2SO_4$; 1 g NaCl	No	5982-0032		

*Katerina Mastovaka and Steven J. Lehotay have done work to extend the scope of QuEChERS beyond fruits and vegetables(1), using it to extract acrylamides in potato chips and other fried foods.
**See: *Screening 36 Veterinary Drugs in Animal Origin Food by LC/MS/MS Combined with Modified QuEChERS Method* (publication 5991-0013EN).
1: Rapid Sample Preparation Method for LC-MS/MS or GC-MS Analysis of Acrylamides in Various Food Matrices. *J. Agric. Food Chem*, 2006, 54, 7001-7008.

QuEChERS dispersive kit, 5982-5022

QuEChERS dispersive kit, 5982-5022CH

QuEChERS Dispersive Kits, Fruits and Vegetables

Step 2: Dispersive SPE Cleanup

Select the Dispersive SPE kit suited to the type of food being analyzed and the method you are following. In this step, an aliquot of the sample extract from Step One is added to a 2 or 15 mL centrifuge tube containing a small amount of SPE sorbent and $MgSO_4$. The sorbent will extract interfering matrix materials from the sample, while the $MgSO_4$ helps remove excess water and improves analyte partitioning. Select kits are now available with ceramic homogenizers (2 per tube).

QuEChERS Dispersive Kits, Fruits and Vegetables

			AOAC 2007.01 Method	European Method EN 15662
Kit	**Size**	**Unit**	**Kit Contents Part No.**	**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

Part numbers ending in CH indicate tubes containing ceramic homogenizers.

(Continued)

QuEChERS Dispersive Kits, Fruits and Vegetables

Kit	Size	Unit	AOAC 2007.01 Method Kit Contents Part No.	European Method EN 15662 Kit Contents Part No.
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 2.5 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 15 mg GCB 885 mg $MgSO_4$ 5982-5256 5982-5256CH
Highly pigmented fruits and vegetables: Removes polar organic acids, some sugars and lipids, plus high levels of carotenoids and chlorophyll; not for use with planar pesticides	2 mL	100/pk	50 mg PSA 50 mg C18EC 150 mg $MgSO_4$ 5982-5122 5982-5122CH	25 mg PSA 7.5 mg GCB 150 mg $MgSO_4$ 5982-5321 5982-5321CH
	15 mL	50/pk	400 mg PSA 400 mg C18EC 1200 mg $MgSO_4$ 5982-5158 5982-5158CH	150 mg PSA 45 mg GCB 855 mg $MgSO_4$ 5982-5356 5982-5356CH
Fruits and vegetables with pigments and fats: Removes polar organic acids, some sugars and lipids, plus carotenoids and chlorophyll; not for use with planar pesticides	2 mL	100/pk	50 mg PSA 50 mg GCB 150 mg $MgSO_4$ 50 mg C18EC 5982-5421 5982-5421CH	
	15 mL	50/pk	400 mg PSA 400 mg GCB 1200 mg $MgSO_4$ 400 mg C18EC 5982-5456 5982-5456CH	

Part numbers ending in CH indicate tubes containing ceramic homogenizers.

(Continued)

QuEChERS Dispersive Kits: Other Food Methods

Kit	Size	Unit	AOAC 2007.01 Method Kit Contents Part No.	European Method EN 15662 Kit Contents Part No.
Other Food Methods Removes biological matrix interferences, including hydrophobic substances (fats, lipids) and proteins	2 mL	100/pk	25 mg C18 150 mg $MgSO_4$ 5982-4921 5982-4921CH	
	15 mL	50/pk	150 mg C18 900 mg $MgSO_4$ 5982-4956 5982-4956CH	
All Food Types Removes all matrix interfering materials including polar organic acids, lipids, sugars, proteins, carotenoids, and chlorophyll	2 mL	100/pk	50 mg PSA 50 mg C18 7.5 mg GCB 150 mg $MgSO_4$ 5982-0028 5982-0028CH	
	15 mL	50/pk	400mg PSA 400 mg C18 45 mg GCB 1200 $MgSO_4$ 5982-0029 5982-0029CH	
Animal Origin Food Removes matrix interferences such as polar organic salts, sugars, lipids, and proteins	15 mL	50/pk	50 mg PSA 150 mg C18EC 900 mg Na_2SO_4 5982-4950	

Part numbers ending in CH indicate tubes containing ceramic homogenizers.

TIPS & TOOLS

View the core concepts surrounding the QuEChERS method at **www.agilent.com/chem/QuEChERSvideo**

Bond Elut Enhanced Matrix Removal—Lipid

Interference from lipids is a problem for labs measuring trace residues in fatty foods or complex biological matrices. Lipids can build up in the instrument and column, decreasing lifetime and reducing analyte sensitivity due to ion suppression. The need for MS maintenance increases too, because of lipid deposits on the source.

The need for lipid removal is well understood, but current methods often sacrifice analyte recovery, removing some of your target analytes along with the lipids.

Now, you don't have to choose between lipid removal and analyte recovery, because innovative Agilent Enhanced Matrix Removal—Lipid delivers the most complete lipid removal AND analyte recovery of any sample prep product.

- **Higher quality results:** a cleaner sample profile leads to greater data integrity and confidence in results, faster data processing and fewer re-runs.
- **Improved productivity:** better sensitivity and signal-to-noise from fewer matrix interferences enables faster data processing and greater sample throughput.
- **Reduced lab costs:** cleaner samples using EMR—Lipid can offer up to 50% less MS source maintenance, giving you more time to analyze samples rather than spend time on costly troubleshooting, downtime and instrument repair.
- **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, to streamline lab efficiency.

The EMR—Lipid dispersive kit consists of 50 15mL centrifuge tubes containing 1 g of preweighed sorbent. This volume can easily accommodate the aliquots specified by AOAC and EN methods. The polishing kit contains 50 15mL centrifuge tubes containing 5g of preweighed polishing salts.

Learn more at **www.agilent.com/chem/EMR-Lipid**

Bond Elut EMR—Lipid

Description	Part No.
Bond Elut dSPE Enhanced Matrix Removal—Lipid	5982-1010
Bond Elut Final Polish for Enhanced Matrix Removal—Lipid	5982-0101

Captiva Filtration

Filtering samples before analysis can deliver longer column lifetime, less downtime, and optimal instrument performance, because even small amounts of particulate can clog your column inlet or contaminate your system. You can remove damaging particulates with Agilent Captiva premium syringe filters—a great choice for simple mechanical filtration.

Captiva premium syringe filters are designed to give you:

- **Greater productivity:** the unique design produces the industry's fastest flow rates
- **High loading capacity:** handle more particulates and greater volumes than other manufacturers' products
- **Lowest extractable levels:** virtually free of extractables under conditions specified by the certificate

All premium syringe filters are certified by LC. What's more, the polyethersulfone and glass fiber filters are certified using LC/MS.

Premium Filters, 100/pk

Description	Diameter (mm)	Pore Size (µm)	Certification	Housing	Part No.
PTFE	4	0.2	LC	Polyproplylene	5190-5082
	4	0.45	LC	Polyproplylene	5190-5083
	15	0.2	LC	Polyproplylene	5190-5084
	15	0.45	LC	Polyproplylene	5190-5085
	25	0.2	LC	Polyproplylene	5190-5086
	25	0.45	LC	Polyproplylene	5190-5087
Nylon	15	0.2	LC	Polyproplylene	5190-5088
	15	0.45	LC	Polyproplylene	5190-5091
	25	0.2	LC	Polyproplylene	5190-5092
	25	0.45	LC	Polyproplylene	5190-5093
PES	4	0.2	LC/MS	Polyproplylene	5190-5094
	4	0.45	LC	Polyproplylene	5190-5095
	15	0.2	LC/MS	Polyproplylene	5190-5096
	15	0.45	LC	Polyproplylene	5190-5097
	25	0.2	LC/MS	Polyproplylene	5190-5098
	25	0.45	LC	Polyproplylene	5190-5099

(Continued)

Premium Filters, 100/pk

Description	Diameter (mm)	Pore Size (µm)	Certification	Housing	Part No.
Regenerated Cellulose	4	0.2	LC	Polyproplylene	5190-5106
	4	0.45	LC	Polyproplylene	5190-5107
	15	0.2	LC	Polyproplylene	5190-5108
	15	0.45	LC	Polyproplylene	5190-5109
	25	0.2	LC	Polyproplylene	5190-5110
	25	0.45	LC	Polyproplylene	5190-5111
Cellulose Acetate	28	0.2	LC	MBS	5190-5116
	28	0.45	LC	MBS	5190-5117
Glass Microfiber	15		LC/MS	Polyproplylene	5190-5120
	28		LC	MBS	5190-5122

Econofilters, PES, 5190-5272

Econofilters, 1000/pk

Description	Diameter (mm)	Pore Size (µm)	Housing	Part No.
PVDF	13	0.2	Polyproplylene	5190-5261
	13	0.45	Polyproplylene	5190-5262
	25	0.2	Polyproplylene	5190-5263
	25	0.45	Polyproplylene	5190-5264
PTFE	13	0.2	Polyproplylene	5190-5265
	13	0.45	Polyproplylene	5190-5266
	25	0.2	Polyproplylene	5190-5267
	25	0.45	Polyproplylene	5190-5268
Nylon	13	0.2	Polyproplylene	5190-5269
	13	0.45	Polyproplylene	5190-5270
	25	0.2	Polyproplylene	5190-5271
	25	0.45	Polyproplylene	5190-5272
PES	13	0.2	Polyproplylene	5190-5273
	13	0.45	Polyproplylene	5190-5274
	25	0.2	Polyproplylene	5190-5275
	25	0.45	Polyproplylene	5190-5276
Polypropylene	13	0.2	Polyproplylene	5190-5277
	13	0.45	Polyproplylene	5190-5278
	25	0.2	Polyproplylene	5190-5279
	25	0.45	Polyproplylene	5190-5280
Regenerated Cellulose*	15	0.2	Polyproplylene	5190-5310
	15	0.45	Polyproplylene	5190-5308
	25	0.2	Polyproplylene	5190-5309
	25	0.45	Polyproplylene	5190-5307

**Premium syringe filter in 1,000/pk*

Captiva filter cartridges, glass fiber, A500401000

Captiva Filter Cartridges

Pore Size (µm)	Filter Material	Volume (mL)	Unit	Part No.
0.2	Polyvinyldifluoride and polypropylene	3	100/pk	A5300002
0.45	Polyvinyldifluoride and polypropylene	3	100/pk	A5307045
		6	100/pk	A5060045
10	Glass fiber	10	100/pk	A500401000

Captiva Non-Drip Filter Cartridges

Pore Size (µm)	Filter Material	Volume (mL)	Unit	Part No.
Non-Drip				
0.22	Polypropylene	3	100/pk	A5300063
Non-Drip Lipids				
0.22	Polypropylene	3	100/pk	A5300635

Captiva 96-well filter plates, A5960045

Captiva 96-well Filter Plates

Pore Size (µm)	Filter Material	Unit	Part No.
0.2	Polypropylene	5/pk	A5960002
	Polypropylene	100/pk	A5960002B
0.45	Polyvinyldifluoride and polypropylene	5/pk	A5967045
	Polypropylene	5/pk	A5960045
	Polypropylene	100/pk	A5960045B
10	Glass fiber	5/pk	A596401000
20	Polypropylene	5/pk	A596002000
	Polypropylene bulk pack	100/pk	A596002000B

TIPS & TOOLS

For more information on Agilent Captiva ND plates, please visit **www.agilent.com/chem/captiva**

Captiva ND 96-well Filter Plates

Description	Unit	Part No.
Captiva ND plate, 0.2 µm, polypropylene Recommended for methanol and acetonitrile	5/pk	A5969002
Captiva ND plate, 0.45 µm, polypropylene Suitable for acetonitrile only	5/pk	A5969045

TIPS & TOOLS

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. Converting to methanol is advantageous when the supply or cost of acetonitrile is restrictive. Methanol can now be your solvent of choice for lipid removal.

For more information about solvents, see: *Agilent Captiva ND Lipids Sample Prep Choice of Precipitation Solvent: Acetonitrile versus Methanol* (publication 5991-0445EN).

Captiva ND Lipids 96-well Filter Plates

Description	Unit	Part No.
Captiva ND Lipids 96-well filtration plate	100/pk	A59640002B
Captiva ND Lipids 96-well filter plate, 1 mL well	1/pk	A59640002I
Captiva ND Lipids 96-well filter plate, 1 mL well	5/pk	A59640002V
DuoSeal 96 96-well plate seals	10/pk	A8961008

AGILENT CROSSLAB SERVICES FOR WATERS ALLIANCE HPLC SYSTEMS

Agilent CrossLab Services delivers solutions that help improve results, reduce costs, and raise productivity—all with a single, dependable contact point for all service and reporting that gives you:

- One contract that covers all instruments to reduce costs
- Fast response to service issues
- High proficiency with instruments
- Direct, multi-vendor capabilities
- Global support coverage
- Proven instrument and service expertise
- Single point of contact for all your service needs

Comprehensive Agilent CrossLab Services optimize productivity by increasing performance across the whole of your laboratory.

Service expertise and convenience from Agilent CrossLab

Agilent service engineers have the skills, qualifications, and experience to deliver all your lab's instrument services—regardless of manufacturer. As an industry leader in designing, manufacturing and servicing laboratory equipment, we have the expertise to consolidate all your service needs into one single, convenient agreement. Whatever your laboratory configuration, Agilent CrossLab can combine onsite service and remote diagnostics to deliver the exact level of support that best meets your goals and budget. Choose from a range of service options that maximize throughput, ensure compliance and minimize costly downtime. With a solution for every service that you might need, and to project your lab against the unknown, our service plans let you choose the service level that meets your needs, goals and budget.

- **Agilent CrossLab Gold**—for mission-critical systems from multiple manufacturers, the Agilent CrossLab Gold service plan provides the optimum mix of proactive scientific instrument service that prevents instrument downtime and high priority onsite support for the fastest response to your service requests. When you simply cannot afford downtime, our Gold service plan provides the level of high-availability support you need.
- **Agilent CrossLab Silver**—for dependable lab operations, Agilent CrossLab Silver helps minimize workflow disruptions and optimize productivity in laboratories with equipment from multiple manufacturers. You get comprehensive instrument repair and maintenance coverage in a single, convenient lab service plan—providing you exactly the level of service you need to ensure reliable instrument performance.
- **Agilent CrossLab Bronze**—covers all required onsite repair visits, including instrument parts and consumables, required to get your system back online without delay. Eliminate unplanned repair costs for your laboratory instruments from various manufacturers with the Bronze service plan. This service, delivered by experienced technicians, ensures that you are fully protected against costly repairs and extended instrument downtime.

Agilent CrossLab Service Plans

	Gold	Silver	Bronze	Preventive Mainenance
Services Included in All Agilent Service Agreements				
Contract-level Preferred Response vs. T&M	✓	✓	✓	
Hardware Telephone Support	✓	✓	✓	
Onsite Repair Services				
All required Onsite Repair Visits	✓	✓	✓	
Parts Required for Repair	✓	✓	✓	
Consumables/Supplies Required for Repair,* including liners, seals, tubing, assemblies, and multipliers	✓	✓	✓	
Maintenance Services				
Annual Onsite Preventive Maintenance	✓	✓		✓
Advanced Diagnostics and Reporting				
Agilent Remote Advisor-Assist**	✓	✓	✓	
Agilent Remote Advisor-Report**	✓	✓	✓	
Agilent Remote Advisor-Alert	✓	✓		
High-Availability Services				
Extended Coverage Hours Discount	✓			
Compliance Services (optional)				
Discount when Bundling Operational Qualification (OQ)	✓	✓		
Guaranteed Pass (OQ)	✓	✓		
Discount when Bundling Re-qualification (RQ)	✓	✓		

*Per local parts replacement policy.
**Where available. Installation required. Installation fees waived when connecting minimum number of systems.

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