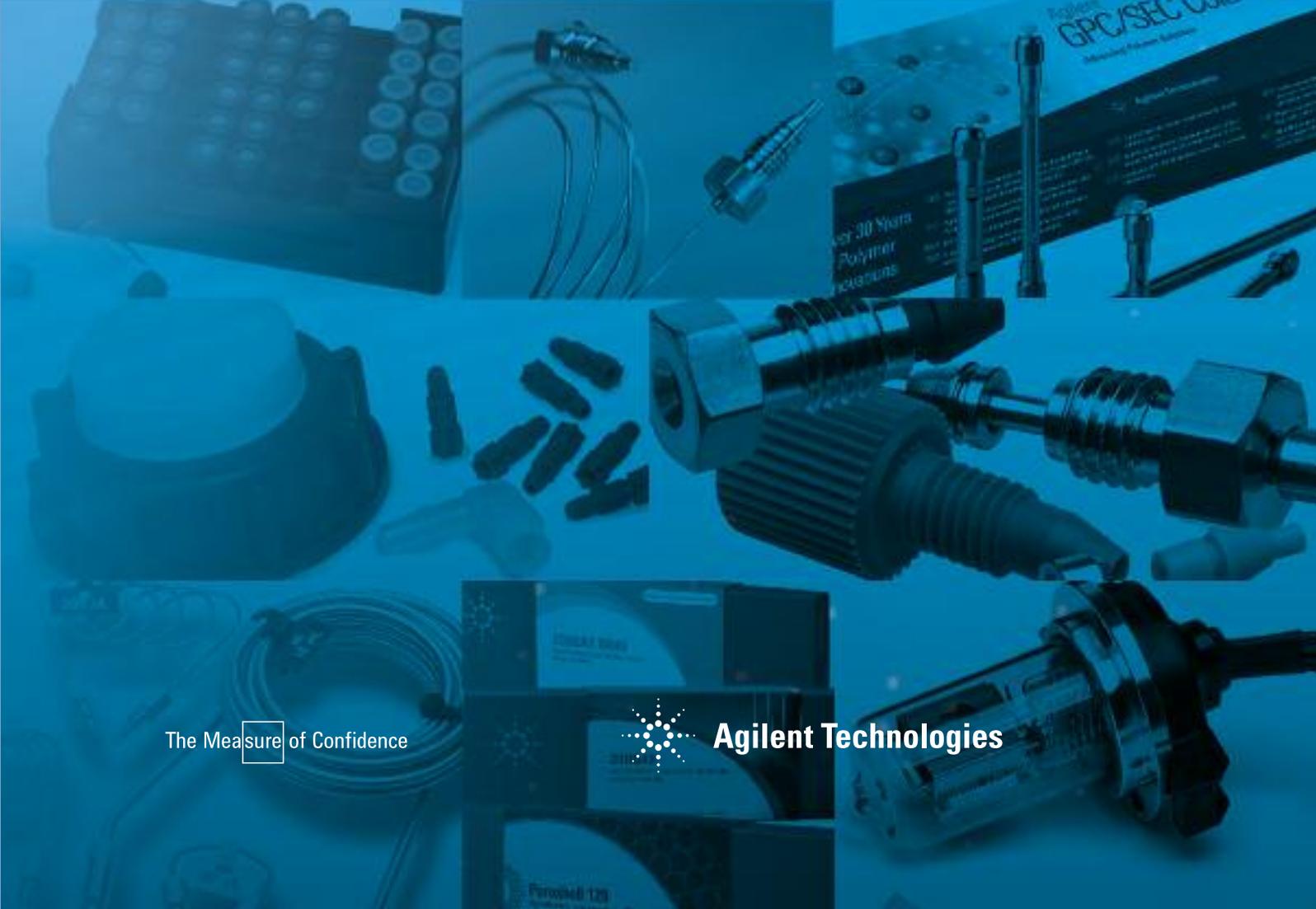




# LC AND LC/MS

Your Essential Resource for Columns & Supplies



The Measure of Confidence



Agilent Technologies

# LC AND LC/MS

## Maximize system performance and produce quality results time after time

Agilent HPLC columns and supplies are designed, tested, and manufactured with the same attention to detail you expect from Agilent instruments. That means your LC or LC/MS system will deliver superior qualitative and quantitative results, consistent reproducibility and reliability, and ultra high-sensitivity detection.

### LC and LC/MS supplies

- LC capillaries ensure tight, leak-free connections to protect the integrity of your LC flow path from raw sample to analytical results
- LC pumps include isocratic, binary, quaternary, capillary and preparative; All key components can be accessed by simply removing the front cover
- From small- and large-volume injection, to multi-phase sampling, Agilent autosamplers help you process samples more quickly and generate better data
- Fraction collectors allow you to collect only the peaks you want, and are ideal for applications such as prep HPLC and protein/peptide purification



### The ZORBAX LC column family

From research... to leading-edge method development... to routine quality assurance... Agilent ZORBAX and Poroshell HPLC columns are optimized for high throughput analysis, and feature the sensitivity, accuracy, and reliability that demanding applications require. Other advantages include:

- A wide selection of chemistries, including Eclipse Plus, Eclipse XDB, StableBond, Extend, Bonus-RP, HILIC and more
- Superior flexibility and scalability with a wide range of particle sizes (1.8, 3.5, 5, and 7  $\mu\text{m}$ ) and column dimensions
- Individual column performance reports that document column-to-column and lot-to-lot reproducibility
- Superior particle strength, even with demanding high-pressure applications



## Table of Contents

<b>Agilent Solutions, Services and Support</b> .....	<b>2</b>	<b>Columns for Small Molecule Separations</b> .....	<b>204</b>
<b>Featured Products</b> .....	<b>6</b>	HPLC Column Selection .....	<b>206</b>
<b>Agilent Parts and Supplies</b>		Fast Columns for Reversed-Phase HPLC/UHPLC .....	<b>227</b>
General LC Supplies .....	<b>11</b>	Columns for Reversed-Phase Analytical HPLC .....	<b>247</b>
LC Capillaries .....	<b>16</b>	Columns for Preparative HPLC .....	<b>311</b>
Fittings and Unions .....	<b>22</b>	Columns for Other HPLC Techniques .....	<b>323</b>
Pump Supplies .....	<b>47</b>	Agilent Specialty Particles .....	<b>347</b>
Autosampler Supplies .....	<b>61</b>	Appendices .....	<b>343</b>
Fraction Collector Supplies .....	<b>68</b>	<b>Columns for Biomolecules</b> .....	<b>350</b>
Valve Supplies .....	<b>72</b>	Biocolumn Selection Guidelines .....	<b>354</b>
Thermostatted Column Compartment Supplies .....	<b>82</b>	Biomolecule Separations .....	<b>353</b>
Detector Supplies .....	<b>89</b>	UHPLC/HPLC Techniques .....	<b>364</b>
Bio-inert Quaternary LC Supplies .....	<b>101</b>	Method Development .....	<b>444</b>
LC/MS Supplies .....	<b>103</b>	Capillary and Nano Columns .....	<b>452</b>
<b>Agilent CrossLab LC Parts and Supplies</b> .....	<b>112</b>	MicroBore Columns .....	<b>461</b>
Product Introductions .....	<b>112</b>	Purification – Prep HPLC .....	<b>464</b>
Supplies for Waters HPLC Systems .....	<b>137</b>	Appendices .....	<b>477</b>
Supplies for Shimadzu HPLC Systems .....	<b>150</b>	<b>Columns and Standards for GPC/SEC</b> .....	<b>488</b>
Supplies for Dionex HPLC Systems .....	<b>157</b>	GPC/SEC Columns .....	<b>490</b>
Supplies for CTC Analytics HPLC Autosamplers .....	<b>169</b>	Polymer Standards .....	<b>530</b>
<b>CE and CE/MS</b> .....	<b>170</b>	<b>Applications</b> .....	<b>552</b>
Solution Kits .....	<b>170</b>	BioPharmaceutical .....	<b>552</b>
Capillaries .....	<b>178</b>	Chemical/Industrial .....	<b>580</b>
Instrument Parts and Supplies .....	<b>191</b>	Environmental .....	<b>583</b>
Troubleshooting .....	<b>201</b>	Food and Consumer Products .....	<b>594</b>
		Pharmaceutical .....	<b>611</b>
		<b>Indices</b> .....	<b>644</b>
		<b>Ordering Information</b> .....	<b>667</b>

# PUT MORE THAN 40 YEARS OF RELENTLESS INNOVATION BEHIND YOUR EVERY RESULT

By continually raising the standards for technologies that support your routine analyses, Agilent's R&D efforts have led to breakthroughs such as:

- **New GC columns** that help you achieve higher levels of inertness and column-to-column reproducibility
- **LC column choices** that deliver the sensitivity and reliability you need for demanding applications
- **Cutting-edge sample preparation products** that promote reliable extraction and concentration
- **Fresh atomic and molecular spectroscopy ideas** for identifying and confirming targets and unknowns

Longtime Agilent customers have experienced our commitment firsthand. And now, we look forward to demonstrating how Agilent's approach to relentless innovation can work to your advantage, too.

## CHEMICAL ANALYSIS SOLUTIONS



### Food

From high-volume screening of vegetables for large numbers of pesticides to rapid identification of pathogens, Agilent understands the analytical needs of food producers, shippers, and regulators. When a new toxin appears, we deploy substantial resources to quickly help customers develop robust and reliable methods. Agilent's leading separations, mass spectrometry, and spectroscopy solutions are emerging as valuable food testing techniques.



### Environmental

Agilent offers more than 40 years of environmental testing and regulatory expertise. We help government and private labs with the full range of assays, from routine testing of soils for heavy metals to detection of pharmaceuticals in groundwater, in concentrations down to parts per trillion.



### Energy and Fuels

Agilent collaborates closely with process industry customers to offer analytical systems that meet their needs for separation, detection, throughput, and support. We'll even preconfigure custom or standard analyzers so they arrive at the lab ready-to-go. Agilent's expertise in both chemical analysis and life science is a powerful combination for researching and producing biofuels, including a wide range of analytical techniques for fatty acid methyl esters (FAMES). Our newly-expanded portfolio also offers powerful tools for developing and producing photovoltaic films and solar panels.



### Forensics

Because the careers of world class athletes and many other individuals hinge on drug testing, it's critical that those doing the testing have the highest level of confidence in the results. Forensics analysts worldwide have grown to depend on Agilent tools for accuracy, reliability, and speed in this high stakes, high-throughput field. Our best selling GC, GC/MS and popular LC and LC/MS are workhorses in forensics labs.



### Traditional Lab Informatics

The ways labs generate and store data profoundly affect their efficiency. Agilent offers a rich, integrated suite of software products built on a set of customer-driven architectural values with the Agilent OpenLAB Laboratory Software Suite. OpenLAB delivers superior performance, open systems integration and investment protection. Our commitment is to deliver more value across each step in the life cycle of scientific data – from data collection and analysis to interpretation and management.



### Materials Science

Agilent offers a newly expanded portfolio of instruments used for the research, manufacturing and testing of advanced materials, from precision optics to pulp, paper and polymers. Tools for chromatography, atomic absorption spectroscopy, molecular spectroscopy, X-ray crystallography, and nuclear magnetic resonance all support continuous progress in materials science.



## Biopharmaceutical

As “multi-omics” studies gain momentum in the search for new therapeutics, Agilent is uniquely positioned to provide the instruments, reagents, and powerful software needed for performing experiments in multiple disciplines and combining the massive amounts of data into biological insight.



## Pharmaceutical

Drug manufacturing requires the accuracy, sensitivity and high throughput of other analytical applications, along with the demands of regulatory record-keeping and validation requirements. Agilent provides a potent combination of rugged, high-throughput tools and unmatched compliance services. Agilent now offers the market-leading family of dissolution apparatus and sampling systems that pair perfectly with our HPLC and UV systems.



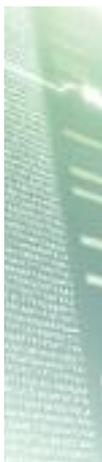
## Proteomics

Research into how large sets of proteins affect the health of an organism requires special sets of analytical tools. Agilent has built a formidable arsenal of liquid chromatograph/mass spectrometers, bioinformatics systems, multiple affinity protein removal columns, and OFFGEL electrophoresis for protein identification and protein biomarker discovery. Accurate-Mass mass spectrometry and the microfluidic HPLC-Chip/MS are two Agilent innovations speeding the work of proteomics researchers around the globe.



## Metabolomics

Collections of small molecules are increasingly being seen as rich sources of biomarkers, but studying metabolites presents many challenges. The need for speed, accuracy, and powerful interpretation capabilities in looking at chemical profile snapshots is underscored because molecules are constantly entering, leaving or changing within the metabolome. Agilent’s GC, LC, NMR and MS portfolios, along with our excellent bioinformatics offerings, user-customizable METLIN metabolite database for LC/MS, and the industry’s first commercial GC/MS retention time locked metabolite library align well with needs of metabolomics researchers.



## Genomics

Agilent is a global leader in microarrays, scanners, and reagents used in a wide variety of genomic-based disease research experiments. Our SureSelect Target Enrichment System dominates the category, streamlining next generation sequencing studies worldwide. Agilent offers a wide range of catalog microarrays and a highly-developed capability to produce custom arrays featuring ink jet-based SurePrint fabrication and the eArray on-line design tool. All Agilent microarrays feature highly sensitive, selective 60-mer probes. With as many as eight arrays printed on a standard 1 x 3 in slide, the cost per experiment becomes very affordable.



## Life Science Informatics

Mirroring its extensive instrument portfolio, Agilent offers the industry’s most extensive suite of bioinformatics software, helping users derive knowledge from complex genomic, proteomic, metabolomic and other biological data. This includes DNA Analytics for analyzing CGH, ChIP and methylation microarray data. The GeneSpring suite includes informatics software for microarray-based gene expression data, genotyping data, and GeneSpring MS, which are useful for analyzing mass spec data from proteomics and metabolomics experiments and comparing complex datasets to explore biological questions from multiple perspectives.



## Lab Automation

To meet the skyrocketing demand for more throughput and automation, Agilent has substantially expanded its lab automation offerings. The Agilent line of liquid handlers and microplate processors are designed to streamline high-volume life science workflows. Agilent is also continually upgrading its advanced autosamplers for LC, GC, LC/MS and GC/MS, adding functionality and speed to reflect the performance of its advanced instruments.



## Vacuum Technology

Agilent works with customers to solve vacuum challenges from experiments in high-energy physics to developing systems for producing flat panel displays. Agilent manufactures vacuum systems used in its own mass spectrometry instruments as well as those of other manufacturers. Agilent’s vacuum technology has been proven by the most powerful physics experiment ever built, CERN’s Large Hadron Collider machine, which was used in the discovery of the Higgs boson particle.



### Get the Agilent Service Guarantee

Should your instrument require service while covered by an Agilent service agreement, we guarantee repair or we will replace your instrument for free.

No other company offers this level of commitment to keep your lab up and running at peak efficiency.



Laboratory decision makers and users ranked Agilent as their first choice for general laboratory compliance services.

# Agilent Service and Support for Instrument Systems

## Focus on what you do best

For over 40 years, Agilent has been building and maintaining the instruments you count on to stay competitive and successful. Trust us to protect your investment with a broad portfolio of services, backed by a global network of experienced service professionals dedicated to the productivity of your lab.

## Agilent Advantage Service Plans

### The best service available for your Agilent instruments

Agilent offers a flexible range of service plans so that you can choose the level of coverage that is best for your lab.

- **Agilent Advantage Gold** – Priority-one coverage for ultimate uptime and productivity
- **Agilent Advantage Silver** – Comprehensive coverage for dependable laboratory operations
- **Agilent Advantage Bronze** – Total repair coverage at a fixed annual price
- **Agilent Repair Service** – Basic coverage for reliable instrument repair

Agilent Advantage service plans include Agilent Remote Advisor for real-time remote monitoring and diagnostics. Through secure internet connections, you can interact with Agilent service professionals, receive detailed asset reports, and configure text or email alerts to notify you before problems occur – helping you to maximize instrument uptime and optimize laboratory workflows.

## Agilent Compliance Services

### Equipment qualification that meets the most stringent requirements

Enterprise Edition Compliance was developed to streamline compliance across your entire lab. Used globally in regulated labs, including standards organizations and regulatory agencies, Enterprise Edition enables you to:

- Improve qualification efficiency by automating protocols across platforms to ensure greater efficiency and minimize regulatory risk
- Standardize your entire compliance operation with robust test designs that work with all your instruments
- Add, remove or reconfigure tests based upon your unique user requirements
- Significantly reduce staff review time with consistently formatted, computer generated, tamper-proof reports

## Agilent Education and Consulting Services

### Our best minds, working for you

Make the most of your instrument with training and consulting from the same experts who designed the instruments, software and processes you use every day.

- Classroom and on-site training in instrument operation, troubleshooting and maintenance
- Customized consulting services to meet your lab's unique needs

## The Agilent Value Promise – 10 Years of Guaranteed Value

In addition to continually evolving products, we offer something else unique to the industry – our 10-year value guarantee. The Agilent Value Promise guarantees you at least 10 years of instrument use from your date of purchase, or we will credit you with the residual value of the system toward an upgraded model. Not only does Agilent ensure a reliable purchase now, but we also ensure that your investment is just as valuable in the future.

For more detailed information, please go to [www.agilent.com/chem/services](http://www.agilent.com/chem/services) or contact your local Agilent Services and Support representative.

## Technical Support at work for you

Have a hardware, software, application, instrument repair or troubleshooting question? Agilent's technical experts are available to answer your questions. With years of laboratory experience, our technical support specialists can provide in-depth knowledge and experience.

For questions pertaining to supplies found in this catalog, contact your local Agilent office or Authorized Agilent Distributor or visit [www.agilent.com/chem/techsupport](http://www.agilent.com/chem/techsupport)



## Need more information?

Visit [www.agilent.com/chem/contactus](http://www.agilent.com/chem/contactus) to:

- Locate your nearest Agilent office or distributor for expert technical support.
- Get fast sales and product assistance by phone. Simply use the scroll-down menu to select your country.
- Receive email assistance using our convenient online forms.

# A Portfolio of Analytical LC Solutions to Match Any Application or Budget

Agilent offers a comprehensive portfolio of solutions for analytical LC that give you uncompromised chromatographic performance while remaining within the confines of your budget. Whatever your application requires – now or in the future – common technology across the portfolio helps you increase laboratory productivity and decrease operational costs. And because it's from Agilent, you get everything you expect from a chromatography leader with over 40 years of innovative contributions to LC and LC/MS technology.

## Agilent 1290 Infinity LC – Infinitely more powerful

With binary and quaternary pump options, The Agilent 1290 Infinity LC is not only the most powerful but also the most adaptive UHPLC system available. No matter what your laboratory requires, the 1290 Infinity LC can handle the widest range of applications. And, with Agilent's Intelligent System Emulation Technology (ISET) built in, you can execute any legacy HPLC or latest UHPLC method for faster method development or instrument-to-instrument method transfer.



## Agilent 1260 Infinity LC – Infinitely more confident

The Agilent 1260 Infinity LC raises the standard in HPLC – without raising the price. It offers new levels of productivity, data quality and robustness to give you highest confidence in your investment. With 600 bar standard pump pressure, 80 Hz standard detector speed and up to 10 times higher UV detection sensitivity, the 1260 Infinity LC prepares you for today's and tomorrow's challenges.

## Agilent 1220 Infinity LC – Infinitely more affordable

The Agilent 1220 Infinity LC is a high quality, integrated system for routine HPLC and advanced UHPLC analysis, for maximum return on investment. Take advantage of the 600 bar power range up to 5 mL/min and 80 Hz detector speed and prepare your lab to take advantage of latest advances in LC column technology.



## Low-flow LC Solutions with Unmatched Performance and Stability

Low-flow LC separation with high sensitivity detection and low sample consumption is a well-established and proven technology. The low-flow technique is used frequently for applications where limited amounts of sample are available, for analysis of trace level components in complex mixtures, or when an optimized LC/MS combination is required. The Agilent 1260 Infinity Low-flow LC systems offer unsurpassed low-flow performance and stability.

### Agilent 1260 Infinity Capillary LC System

Using a unique technology, the Agilent 1260 Infinity Capillary LC System is optimized for capillary LC. A wide range of flow rates expands laboratory flexibility, offering unparalleled sensitivity and reproducibility. The system is ideally suited for both UV and MS applications.



### Agilent 1260 Infinity Nanoflow LC System for MS

Nanoflow LC is widely used for high resolution separations and high sensitivity MS detection. The Agilent 1260 Infinity Nanoflow LC System incorporates Agilent's unique Electronic Flow Control (EFC) with active feedback and real time flow adjustment for constant flow delivery to the column independent of system backpressure. After its first introduction with Agilent capillary and nanoflow pumps, EFC with real time flow control is the gold standard for reliable and robust nanoflow performance.

### Agilent 1260 Infinity HPLC-Chip/MS System

The Agilent 1260 Infinity HPLC-Chip/MS System is a microfluidic chip-based technology for nanospray LC/MS. Combined with the high performance Agilent 6000 MS systems, the HPLC-Chip II for LC/MS offers even more overall robustness, reliability and ease-of-use. Applications include proteomics and small molecule analysis. A custom chip program delivers customized success.



## Agilent 6000 Series LC/MS Solutions

A comprehensive portfolio of LC/MS instrumentation with exceptional MS performance, spectral quality, and productive data analysis tools to address a full range of qualitative and quantitative applications and match your budget.



### Agilent 6100 Series Single Quadrupole LC/MS Systems

Unprecedented performance and reliability, day-after-day

The Agilent 6100 Series Single Quadrupole systems deliver superior MS data quality in an easy-to-use, space-saving package. With configurations to fit all budgets, the industry's most popular single-quad LC/MS complements your existing LC detectors and integrates seamlessly with Agilent's ChemStation LC control. The 6100 Series Single Quadrupole LC/MS provides complementary information to ultraviolet diode array detection (UV-DAD).

Agilent 6120 – Budget friendly and very easy to use – with Agilent's 1220 Infinity LC, a perfect workhorse addition for labs just getting into LC/MS.

Agilent 6130 – Flexible, high performance solution ideal for any quantitation application with 3,000 amu mass range and 1 pg sensitivity – now compatible with Agilent Jet Stream Technology.

Agilent 6150 – Unsurpassed data quality for UHPLC and high-throughput screening and qualitative applications, with faster scan speed (10K amu/s) and the power of Agilent Jet Stream Technology.

### Agilent 6200 Series Accurate-Mass TOF LC/MS Systems

Unmatched confidence of Ultra High Definition  
Time-of-Flight (TOF) technology

The Agilent 6200 Series TOF systems deliver unmatched speed, mass accuracy and resolution performance in a compact benchtop design. Superior data quality offers certainty for screening, identification and quantitative studies.

Agilent 6224 – Affordable and easy-to-use instrument with <2 mg/L mass accuracy and 20,000 resolution for routine analysis of a wide variety of molecules such as pesticides, pharmaceuticals, peptides and intact proteins.

Agilent 6230 with Agilent Jet Stream Technology – Offers 5-10x more sensitivity for confident screening of compounds at low concentration.



## Agilent 6400 Series Triple Quadrupole LC/MS Systems

Clearly better sensitivity gives better results

The Agilent 6400 Series Triple Quadrupole systems offer unmatched sensitivity and reliability for trace analysis in food safety, environmental samples, biomarker validation, and ADME/DMPK studies for drug candidates. Powered by Agilent MassHunter software, with Optimizer to automatically fine tune parameters for ion transitions, the 6400 Series Triple Quadrupole systems offer simplified method development to achieve outstanding results.

Agilent 6420 – Economical, easy to use, with Agilent 1260 Infinity LC, a perfect workhorse instrument for labs with basic needs for quantitative capabilities.

Agilent 6430 – Offers added sensitivity to achieve outstanding performance for most assays.

Agilent 6460 with Agilent Jet Stream Technology – Provides dramatically improved sensitivity for your most demanding quantitative applications.

Agilent 6490 – Incorporates the revolutionary iFunnel technology to give ultimate sensitivity for the most challenging quantitative analyses in pharmaceutical, clinical, food safety, and environmental applications.



## Agilent 6500 Series Accurate-Mass Q-TOF LC/MS Systems

Ultra high definition MS/MS, uncompromised performance

The Agilent 6500 Series Q-TOF systems deliver an unmatched combination of mass accuracy, mass resolution, sensitivity, dynamic range and speed. With best-in-class MS and MS/MS mass accuracy, they provide the capabilities you need to profile, identify, characterize, and even quantify samples as diverse as drug impurities, endogenous metabolites, and protein biomarkers.

Agilent 6520 – Easy-to-use instrument for routine analysis of a wide range of compounds day in and day out.

Agilent 6530 with Agilent Jet Stream Technology – Provides 5-10x more sensitivity for screening of low level compounds.

Agilent 6538 – Provides enhanced resolution in a bench top instrument for confident characterization of complex samples.

Agilent 6540 with Agilent Jet Stream Technology – Combines the highest levels of sensitivity with enhanced resolution to address the most challenging applications.





## Agilent ZORBAX 300 StableBond Columns

ZORBAX 300 StableBond columns are an ideal choice for the reproducible separations of proteins and peptides. 300 StableBond columns are unmatched in their durability at low pH, such as with the TFA containing mobile phases typically used for protein and peptide separations. For LC/MS separations at low pH, 300 StableBond columns can also be used with formic acid and acetic acid mobile phase modifiers.

**Turn to page 367.**



## Agilent Poroshell Columns

As new biopharmaceutical research and manufacturing practices focus more and more on peptides and proteins, and as time to market becomes increasingly critical, the rapid HPLC separation of biomolecules becomes increasingly valuable. The speed and resolution benefit shown here by Agilent Poroshell columns improve chances that the desired separation will be achieved while facilitating separation analysis times.

**For Poroshell 120, turn to page 228.**

**For Poroshell 300, turn to page 380-381.**

## Agilent LC Capillaries

Agilent LC capillary starter kits contain the most often used capillaries and fittings. Our genuine flexible stainless steel capillaries make the best connection in your LC system, no matter the brand. The kits are for use with 3-4 or 1-2 mm id columns, as well as for Micro LC columns. The free Cybertool, which contains over 30 tools, is useful in every laboratory.

**Turn to page 16.**



## Agilent ZORBAX RRHD HILIC Plus

HILIC can have distinct advantages over traditional RPLC in terms of LC/MS sensitivity, due to the use of highly organic mobile phases. These mobile phases have higher volatility than traditional RPLC mobile phases, making HILIC well suited for applications with mass spectrometers. Agilent ZORBAX RRHD HILIC Plus is the column to choose.

**Turn to page 324.**



# General LC Supplies

Agilent offers a wide range of supplies for operation and maintenance of LC systems. These products have been carefully designed or selected by Agilent to work with your Agilent instruments for maximum performance and uptime.

## LC Tools

Your Agilent LC system arrives with a full complement of tools needed to perform general maintenance and operation procedures. Should you need additional or replacement tools, Agilent offers a selection of high-precision, high-quality, stainless steel tools, to avoid any deformation of the screws or nuts.

### LC Tools

Description	Part No.
Tool kit hex keys, Rheotool Includes 3 hex keys, 4 mm, 1.5 mm, and 9/64 in, with straight or T-handle plus Rheotool	5064-8211
Torque wrench adapter Used with nanoliter flow cell for Diode Array Detector to mount capillaries of cell (P/N G1315-68714)	G1315-45003
Insert tool (seal wash option)	01018-23702
Mounting tool for flangeless nut	0100-1710
Mounting clamp	5021-1866
Velocity regulator	5062-2486
USB memory stick	G4208-68700
Compact flash card	01100-68700
HPLC system tool kit	G4203-68708
Compact tool kit	G4296-68715
Torque wrench, 2-25 Nm	G4220-20012
Bit kit for torque wrench	5023-0282
PEEK Luer lok needle assembly	5190-0924
Plastic tubing cutter	8710-1930
Blades for plastic cutter, 5/pk	8710-1931
Tubing clip	5042-9967
Tubing clip	5042-9954
Open end wrench, 14 mm	8710-1924



Hex keys, Rheotool 5064-8211



Mounting tool, 0100-1710



HPLC system tool kit, G4203-68708



Compact tool kit, G4296-68715



Torque wrench, 2-25 Nm, G4220-20012



Plastic tubing cutter, 8710-1930



Tubing clip, 5042-9967

# HPLC In-Line Filters

Column inlet frit contamination can increase column backpressure and reduce efficiency. Microbore column blockages are a particular problem, due to the small diameter of the inlet frit. To prevent blockages, always use the appropriate filters in your LC system. Agilent offers two types of high pressure in-line filter kits for use with any HPLC system.

## HPLC In-Line Filters

Description	Frit Porosity (µm)	Frit Inlet ID (mm)	Comments	Part No.	Replacement Frits
RRLC in-line filter 4.6 mm, 0.2 µm pore size filter, connecting capillary, max 600 bar	0.2	4.6	max 600 bar	5067-1553	5067-1562, 10/pk
RRLC in-line filter 2.1 mm, 0.2 µm pore size filter, connecting capillary, max 600 bar	0.2	2.1	max 600 bar	5067-1551	5067-1555, 10/pk
Low dispersion in-line filter Includes two frits, 2.1 mm, 2 µm pore size filter holder with inserts, 60 x 0.12 mm connecting capillary	2 0.5	2.1	< 1 mL/min	01090-68702	280959-904, 10/pk 280959-907, 10/pk
Universal in-line filter Includes two frits, 4.8 mm, 2 µm pore size filter holder with inserts, 130 x 0.25 mm connecting capillary	2	4.8	1-5 mL/min	01090-68703	01090-27609, 2/pk
Semi-prep filter	0.5	12.7	1-5 mL/min	5064-8273	5022-2185
High pressure semi-prep filter	10	19	5-10 mL/min	5022-2165	5022-2166, 10/pk
Prep filter	10		10-100 mL/min	5065-4500	5065-9901 Replacement Glass Cartridge
In-line filter for G1311A			Recommended when high salt concentrations are used	G1311-60006	
1290 Infinity LC in-line filter (0.3 µm)	0.3	2.0	1200 bar	5067-4638	5023-0271, 5/pk



RRLC in-line filter, 5067-1551



Low dispersion in-line filter, 01090-68702



Semi-prep filter, 5064-8273



High pressure semi-prep filter, 5022-2165



1290 Infinity LC in-line filter, 5067-4638

## Solvent Filters/Degassers

An added benefit of filtering solvents is that degassing occurs at the same time. This is particularly beneficial if you do not have an on-line degasser in your system. The benefits of solvent filtration:

- Degasses eluents as particulates are removed
- Prevents the formation of spurious peaks within the detector due to solvent outgassing at the low-pressure end of the chromatograph
- Increases solvent inlet lifetime
- Eliminates pump downtime caused by air locks and particulates in check valves
- Decreases piston wear, while increasing column life

### Solvent Filters/Degassers

Description	Part No.
HPLC solvent filter/degasser assembly	3150-0577
<b>Replacement Parts for 3150-0577</b>	
Glass funnel, 250 mL	5188-2743
PTFE coated sieve	5188-2744
PTFE seal	5188-2745
Funnel base, glass	5188-2746
<b>Filter Membranes</b>	
Regenerated cellulose filter membranes Diameter 47 mm, pore size 0.45 $\mu\text{m}$ , 100/pk	3150-0576
Nylon filter membranes Diameter 47 mm, pore size 0.45 $\mu\text{m}$ , 100/pk	9301-0895
PTFE filter membranes Diameter 47 mm, pore size 0.45 $\mu\text{m}$ , 10/pk	3150-0509



Glass solvent filter degasser, 3150-0577

## Agilent Rack for LC Systems

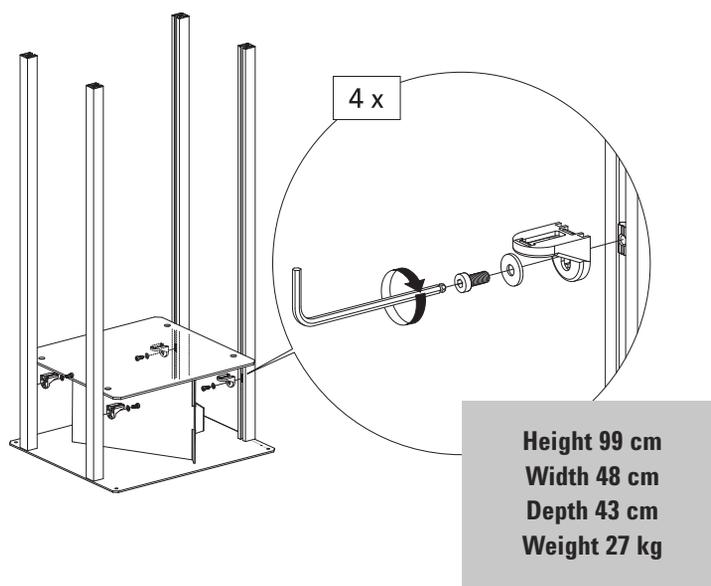


Agilent rack for LC systems, 5001-3726

Reclaim critical bench space with the stable, robust rack for LC systems. The sturdy and open design offers complete protection for your sensitive LC system and easy maintenance for fast, safe access to instruments and cables. It is designed for all Agilent LC modules stacks and features:

- Easy assembly saves time and expense (see diagram)
- Adjustable shelves allow full customization for all Agilent LC modules
- Open design ensures proper airflow management and distribution of equipment and cabling

Description	Part No.
Agilent rack for LC systems	5001-3726



Height 99 cm  
Width 48 cm  
Depth 43 cm  
Weight 27 kg

### TIPS & TOOLS



The Agilent rack can be used to optimize your 1290 Infinity LC for ultra-low dispersion, which can enhance performance of high-efficiency columns. Further information can be found in application note 5990-9502EN at [www.agilent.com/chem/library](http://www.agilent.com/chem/library)

## LC Standards

### LC Standards

Description	Part No.
Caffeine standards kit for LC OQ/PV Includes one 10 mL ampoule: 125.0 µg/mL; four 5 mL ampoules: 5.0, 25.0, 250.0 and 500.0 µg/mL caffeine in water	8500-6762
Caffeine standards kit for capillary OQ/PV Includes 5 ampoules, 5 mL: 2.0, 4.0, 20.0, 100.0, 200.0 µg/mL caffeine in water	5065-4420
Caffeine OQ/PV sample for dissolution test, 150 mg/L caffeine in water, 500 mL	5042-6476
Caffeine standard, 250 µg/mL	G4218-85000
Enterprise Edition caffeine standard kit	5190-0488
Fluorescence detector calibration sample, 1 g glycogen	5063-6597
RI detector OQ/PV test sample Includes 5 ampoules, 5 mL: 5, 10, 15, 25, and 50 mg/mL glycerin in water	5064-8220
Isocratic and gradient standards Contains 0.15% diethylphthalate, 0.01% biphenyl, and 0.03% terphenyl in MeOH (w/w). Gradient standard includes 0.32% dioctyl phthalate as well. Two 0.5 mL ampoules of each.	01080-68702
Isocratic standard, 0.5 mL ampoule	01080-68704
RRLC Check out sample, 1 mL ampoule	5188-6529
Chip cube high mass reference (HP-1221), 0.5 mL	G1982-85001
Chip cube high mass solvent (FC-70), 25 mL Fluorinert	G1982-85002
Chip cube low mass reference sample, 1 g Methyl stearate	G1982-85003
ESI+APCI LC demo sample Contains 5 x 1 mL ampoules with 33 ng/µL crystal violet, 77 ng/µL carbazole, 300 ng/µL 9-phenanthrol, 1 ng/µL 1-hexanesulfonic acid sodium salt in water/methanol 60:40	G1978-85000
ES-TOF biopolymer reference standard kit Contains 7 x 2 mL ampoules with 5 mM purine, 1 M ammonium formate, 0.5 mM HP-0285, 0.1 mM HP-0321, 0.2 mM HP-1221, 0.2 mM HP-1821, 0.5 mM HP-2421	G1969-85003
HSA peptide standard mix kit 2 vials with 6 lyophilized peptides	G2455-85001



Caffeine OQ/PV sample for dissolution test, 5042-6476



Agilent's unique laser welding process ensures that the capillary ends are absolutely flat, eliminating any chance of capillary-induced dead volume.

## LC Capillaries

Your LC system's components are only as reliable as the connections between them

Think of your LC system as a chain from analyte... to pump... to column... to detector... to waste. Every link must operate at maximum efficiency, or the whole chain risks failure – compromising your results.

### Agilent LC capillaries: Your link to analytical success

At Agilent, we invest heavily in the quality of our capillary connections. All are engineered and manufactured to the same quality standards as our columns and instruments, so you can protect the integrity of your results at every step of your LC flow path.

Using our flexible stainless steel and polymer capillaries and fittings can provide:

- Tight, leak-free connections
- Zero dead volume connections
- An inert surface (when using polymer or PEEK/stainless steel bio-inert capillaries)
- High flexibility without sacrificing durability
- Easy cutting to the exact length you need (PEEK tubing)
- Predefined lengths for specific flow path locations (capillaries)

In addition, all Agilent capillaries are precision cut with square ends, are burr-free, have no inner-diameter distortion, and come in a variety of materials to suit your needs.



## Engineering of Agilent Capillaries

The same professional engineers in our LC manufacturing facility in Germany who design our industry-leading LC instruments, also play a critical role in developing capillaries and fittings for your instrument. Their attention to detail helps you to get the best performance possible for your applications.

Our LC manufacturing tools – like high-end, special laser-cutting machines – result in completely tight, smooth and perfect-cut capillaries. Our broad selection of capillaries is made only from the highest-quality materials and will meet any of your application needs.

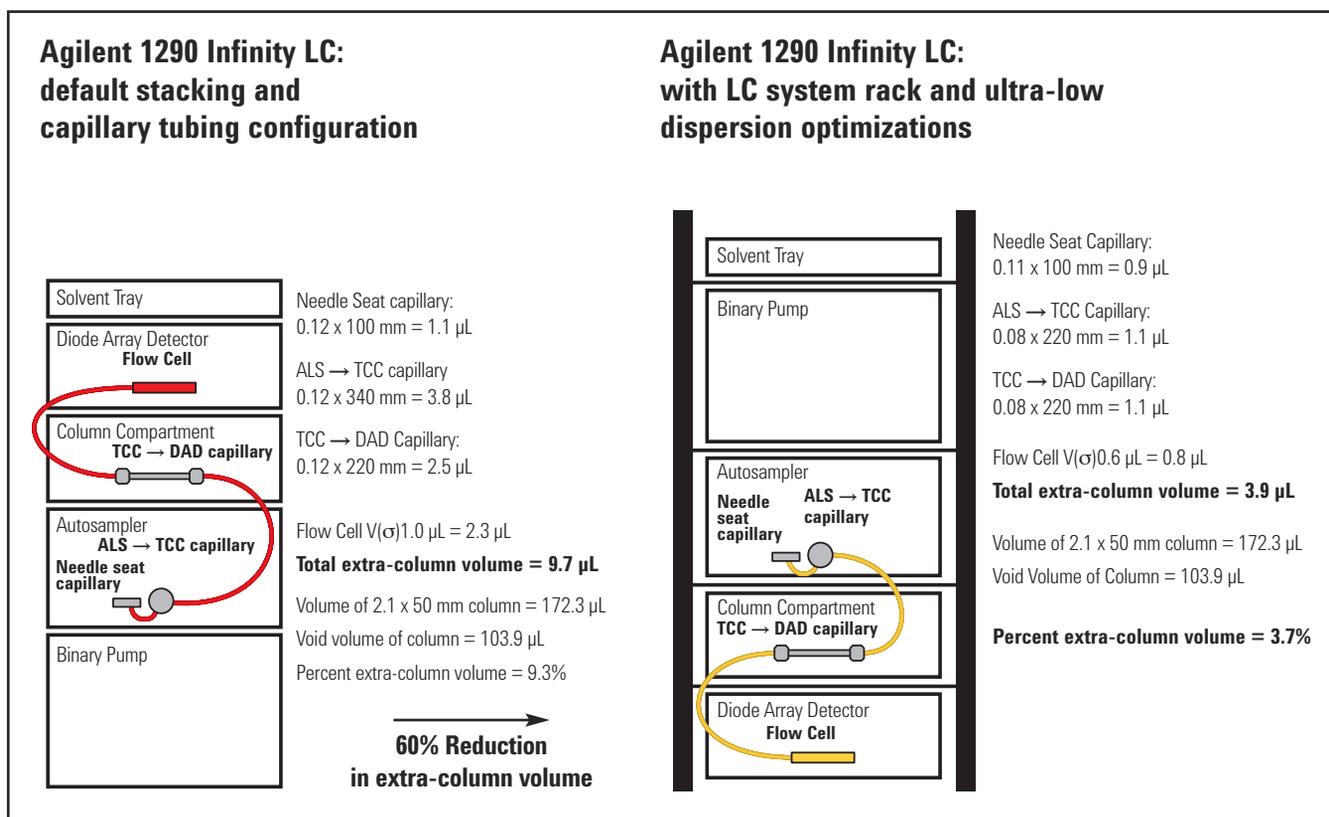
Avoid chromatographic issues – like peak broadening and system leaks – by choosing Agilent’s selection of premium capillaries. Agilent is committed to Fast LC and high-productivity performance, together with accurate quantitation.



### Advantages for Bio Capillaries

- Laser-welded capillary tip for precise capillary cut
- Metal-free connection for all HPLC applications
- PEEK and stainless steel design allows you to exceed typical pressure limit reached with conventional polymer

## Recommended HPLC Stack Configuration



## Syntax for capillary description

The tables below will be your guide to identifying the proper specifications for your capillary. On all capillaries, dimensions are noted in id (mm), length (mm) and where applicable, volume (µL). When you receive your capillary, these abbreviations are printed on the packaging.

Using the guide: This fitting is coded as "SPF", for Swagelok, PEEK, Finger-tight.

### Type

Key	Description
Capillary	Connection capillaries
Loop	Loop capillaries
Seat	Autosampler needle seats
Tube	Tubing
Heat exchanger	Heat exchanger

### Material

Key	Description
SS	Stainless steel
Ti	Titanium
PK	PEEK
FS/PK	PEEK-coated fused silica*
PK/SS	Stainless steel-coated PEEK**
PTFE	PTFE
FS	Fused silica

\*Fused silica in contact with solvent

\*\*PEEK in contact with solvent

### Fitting Left/Fitting Right

Key	Description
W	Swagelok + 0.8 mm Port id
S	Swagelok + 1.6 mm Port id
M	Metric M4 + 0.8 mm Port id
E	Metric M3 + 1.6 mm Port id
U	Swagelok union
L	Long
X	Extra long
H	Long head
G	Small head SW 4 mm
N	Small head SW 5 mm
F	Finger-tight
V	1200 bar
B	Bio
P	PEEK

The **type** gives some indication on the primary function, like a loop or a connection capillary.

The **material** indicates which raw material is used.

The **fitting** left/right indicate which fitting is used on both ends of the capillary.

## At-a-glance color-coding keys

The color of your capillary will help you quickly identify the capillary id – see the chart to the right for reference.

### Color-coding key for Agilent capillary tubing

Internal Diameter in mm	Color code
0.015	Orange
0.025	Yellow
0.05	Beige
0.075	Black
0.1	Purple
0.12	Red
0.17	Green
0.20/0.25	Blue
0.3	Grey
0.50	Bone White

Tip: As you move to smaller-volume, high efficiency columns, you'll want to use narrow id tubing, as opposed to the wider id tubing used for conventional HPLC instruments.

Agilent capillary supplies are made from a variety of top-quality materials to suit your lab's every need

### **Stainless Steel:** good resistance to pitting corrosion

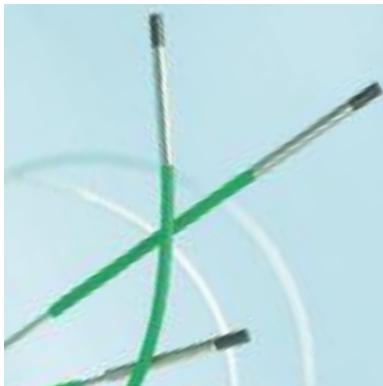
Stainless steel is ideal for most standard applications – except where bio-inertness is required, in which case we recommend PEEK-lined or Bio-inert titanium capillaries. Agilent's 0.6 mm od flexible grade 316L stainless steel capillaries (chrome/nickel/molybdenum bearing grade) are also much easier to handle than conventional, rigid 1.6 mm od capillaries.



### **Titanium:** high inertness for biological applications

Analyzing metal-sensitive proteins and biotherapeutics presents challenging solvent conditions for LC instruments. In addition, bio-molecules tend to bind non-specifically to surfaces. For these reasons, bio-inert titanium is the best choice for these applications. Titanium is biocompatible, making Bio-inert Titan capillaries perfect for applications where bio-inertness is paramount.





## **Stainless Steel-coated PEEK:** high-pressure bio-inertness and robustness

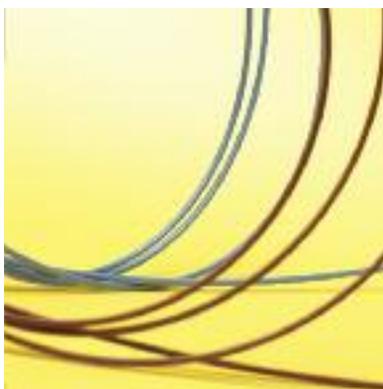
In bio-chromatography, capillaries and connectors should be inert to ensure the lowest interaction with protein samples. They must also be highly robust to withstand harsh cleaning procedures.

Unfortunately, metal-free PEEK capillaries can only withstand pressures of up to 200 bar in a thermostatically controlled cabinet with acetonitrile; even then, flexibility is compromised. To meet the growing need for bio-inertness, robustness, and higher operating pressures, Agilent has engineered a bio-inert PEEK liner clad with high-strength stainless steel to withstand pressures of at least 600 bar. This same technology is used in Agilent capillary fittings – giving you a strong, metal-free, capillary/ connector flow path for bio-inert applications.



## **PEEK-coated fused silica:** rugged and pliable

Since their introduction in the early 1980s, fused silica capillaries have become the industry standard for many GC and LC applications – as well as capillary electrophoresis. Agilent fused-silica capillaries are made from high-purity silicon dioxide, and coated with PEEK for strength, durability, and pliability.



## **PEEK:** durable and abrasion-resistant

Agilent PEEK capillaries are best for standard and bio-inert applications. PEEK (polyetheretherketone) is a thermoplastic polymer that resists mechanical and solvent damage, even at high temperatures. Because it is less vulnerable to corrosion than stainless steel, PEEK can be used in place of stainless steel when the capillary's external diameter is 1/16 in or less. It also resists abrasion, making it an excellent coating for fused silica capillaries. **Tip:** Use our color-coded PEEK fittings to track inlets and outlets of valves, columns, and detectors.

To learn more about Agilent LC capillary supplies, or to order now, visit [www.agilent.com/chem/LCcapillaries](http://www.agilent.com/chem/LCcapillaries)

## Agilent capillaries for routine applications

Category	Applications	Internal diameter (mm)	Pressure limit (bar)	pH range	Comments
Stainless steel	<ul style="list-style-type: none"> <li>All capillary applications, except where bio-inertness is required</li> <li>1/32 in od designed for Agilent 1100 systems</li> <li>1/16 in and 1/8 in od for most applications</li> </ul>	0.075	1200	1-14	<ul style="list-style-type: none"> <li>Flexible for easy routing</li> <li>Ready to use: cleaned and passivated to a high standard</li> <li>Pre-cut capillaries are optimized for the lowest internal volume</li> <li>Use pre-cut lengths to maintain zero-dead-volume performance</li> </ul>
		0.12			
		0.17			
		0.25			
		0.3			
		0.5			
0.61					
0.93					
Titanium	<ul style="list-style-type: none"> <li>Where ultimate bio-inertness is essential</li> </ul>	0.17 0.61	600	1-14	
Stainless-steel-coated PEEK	<ul style="list-style-type: none"> <li>Universal for standard and bio-inert applications</li> <li>UHPLC bio-inert applications</li> </ul>	0.17	600	1-14	<ul style="list-style-type: none"> <li>Metal-free flow path</li> <li>Robust</li> <li>Flexible</li> <li>Resists corrosion better than stainless steel</li> </ul>
PEEK-coated fused silica	<ul style="list-style-type: none"> <li>Industry standard for most LC applications</li> </ul>	0.025	690	1-10	<ul style="list-style-type: none"> <li>Mechanically strong</li> <li>Consistent, rigid flow path</li> <li>Ideal replacement for stainless steel</li> <li>To avoid permanent tube damage, always use pre-cut lengths</li> </ul>
		0.050			
		0.075			
		0.100			
		0.125			
PEEK	<ul style="list-style-type: none"> <li>Most HPLC applications</li> </ul>	0.13	480*	1-14	<ul style="list-style-type: none"> <li>Smooth internal surface minimizes turbulence for improved resolution</li> <li>Flexible, easily cut to length</li> <li>Use with PEEK or stainless steel fittings</li> <li>Excellent solvent compatibility</li> </ul>
		0.18	200**		
		0.25			
		0.50			

\*At ambient temperature with water

\*\*With acetonitrile at non-ambient temperature



## Fittings for a strong, capillary flow path

Agilent offers more than 20 fitting varieties for Swagelok-type or metric M4/M3-type connections. Depending on your application, different materials must be used:

- Stainless steel or PEEK delivers permanent high-pressure sealing performance for connections such as valves, heaters, and columns
- Stainless steel ensures permanent high-pressure sealing and optimal performance throughout your LC system up to 1200 bar
- Finger-tight fittings (polymeric for 400 bar and polyketone for 600 bar) are a convenient option; They allow easy end fitting adjustment, so you can seat the capillary into the column properly, preventing extra-column voids and leaks
- High-pressure fittings, which can be used with pressures up to 1200 bar, can be removed and replaced
- It's a good idea to use stainless steel nuts and ferrules for instrument connections, and PEEK nuts and ferrules for column and guard column connections, since these are changed most frequently

### Agilent fittings for leak-free connections

Fitting type	Advantages/Tips
Swagelok-type fittings	<ul style="list-style-type: none"> <li>• Suitable for most connections</li> <li>• Available in a variety of combinations:                             <ul style="list-style-type: none"> <li>• One piece or multiple pieces with nut + front and back ferrules</li> <li>• Stainless steel, PEEK, polyketone, or a stainless steel/PEEK combination</li> </ul> </li> </ul>
Metric M4/Metric M3	<ul style="list-style-type: none"> <li>• For micro valve connections</li> </ul>
Stainless steel	<ul style="list-style-type: none"> <li>• At least 1200 bar</li> <li>• Most popular material for permanent, high-pressure sealing</li> <li>• Use our slitted socket wrench (Part No. 8710-2391 or 5023-0240) for optimal tightness</li> </ul>
1200 bar removable fittings for 1290 Infinity LC	<ul style="list-style-type: none"> <li>• 1200 bar</li> <li>• Available in standard, long, and extra-long sizes for compatibility with columns that have different sized nuts</li> <li>• Removable and replaceable</li> <li>• Use our slotted socket wrench (Part No. 8710-2391 or 5023-0240) for optimal tightness</li> </ul>
PEEK	<ul style="list-style-type: none"> <li>• Up to 400 bar (at ambient temperature with water)</li> <li>• Easy, finger-tight column connections</li> <li>• Ideal for frequently changed connections, such as column connections</li> <li>• Pressure is less critical</li> </ul>
Polyketone	<ul style="list-style-type: none"> <li>• &lt;600 bar (600 bar pressure rating)</li> <li>• Easy, finger-tight column connections</li> <li>• Fits stainless steel tubing</li> </ul>

**Agilent 1260/1200/1100 Infinity Series LC**

From (A)	To (B)	Material	ID (mm)	Length (mm)	Fitting Type From	Fitting Type To	Notes	Part No.
Pump	Autosampler	SS	0.17	900	S	S	Pre-swaged on A	G1329-87300
Pump	Autosampler	SS	0.17	700	S	S	Pre-swaged on A and B	G1312-87304
Pump	Autosampler	SS	0.17	500	S	S	Pre-swaged on A	G1312-67305
Pump	Autosampler	SS	0.17	400	S	S	Pre-swaged on A and B	G1312-87303
Pump	Autosampler	SS	0.17	380	S	S	Pre-swaged on A and B	01090-87306
Manual Injector	Column	SS	0.17	180	S	S	Pre-swaged on A	G1313-87305
Manual Injector	TCC	SS	0.17	500	SH	S		G1328-87600
Heater	Column	SS	0.17	90	S	S		G1316-87300
Column	Detector	SS	0.17	380	S	S	Pre-swaged on A; thermal isolation	G1315-87311
TCC\WVD	MS	SS	0.12	500	S	S	Pre-swaged on A	G1316-87309
Column	WVD	PK	0.17	600			Finger-tight fittings not included (0100-1516, 2/pk)	5062-8522
Pump Purge Valve	Waste	PK	1.3	5000*			No fitting needed	5062-2461
Detector	Waste	PTFE	0.8	5000*			Finger-tight fittings not included (0100-1516, 2/pk)	5062-2462
WVD	Waste	PK	0.25	500			Finger-tight fittings not included (0100-1516, 2/pk)	5062-8535
Autosampler	TCC	SS	0.12	180	S	S	Pre-swaged on A; can also be connected to low dispersion heat exchanger	G1313-87304
Thermostatted Autosampler	TCC	SS	0.12	280	S	S	Pre-swaged on A; can also be connected to low dispersion heat exchanger	01090-87610
TCC	Column	SS	0.12	105	S	S	Pre-swaged on A	01090-87611
Column	DAD	SS	0.12	150	S	S	Pre-swaged on A	G1315-87312
Female adapter for connecting long columns		SS	0.17	150	S			G1315-87303
Purge Valve**	Waste	SS and FS	0.17	150	S	U		G1312-67500

\*Capillary is intended to be cut to the right length for your need.

\*\*Calibration capillary assembly

**Material**

Key	Description
SS	Stainless steel
PK	PEEK
PTFE	PTFE
FS	Fused silica
S	Swagelok 1.6 mm port id
SH	Swagelok 1.6 mm port id, long head
U	Swagelok union

Agilent 1290 Infinity Series LC

From (A)	To (B)	Material	ID (mm)	Length (mm)	Fitting Type From	Fitting Type To	Notes	Part No.
Pump	Autosampler	SS	0.17	300	S	S	Pre-swaged on A and B	5067-4657
Pump	Thermostatted Autosampler	SS	0.17	450	S	S	Pre-swaged on A and B	5067-4658
Autosampler	TCC	SS	0.12	340	S	S	Pre-swaged on A	5067-4659
Column	DAD	SS	0.12	220	S	S	Pre-swaged on A	5067-4660
1290 System	CTC Autosampler	SS	0.17	600	S	SH	Pre-swaged on A	5067-4670
CTC Autosampler	Column	SS	0.12	600	S	S		5067-4669
Detector	Waste	PTFE	0.8	5000*			Finger-tight fittings not included (0100-1516, 2/pk)	5062-2462

\*Capillary is intended to be cut to the right length for your need.



Stainless steel fittings (S), 5062-2418



Finger-tight PEEK fitting (SPF), 0100-1516



Stainless steel back ferrule, 5180-4114

Images shown are capillary fittings. For complete information on fittings, turn to page 40.

**Agilent 1290 Valve Head**

From (A)	To (B)	Material	ID (mm)	Length (mm)	Fitting Type From	Fitting Type To	Notes	Valve Information	Part No.
Autosampler	Valve with Swagelok port	SS	0.12	340	S	SX	Pre-swaged on A		5067-4684
Autosampler	Valve with Swagelok port	SS	0.12	340	S	SX	Pre-swaged on B	G4231A/B 2 Position/6 Port valve head, 600/1200 bar	5067-4647
Autosampler	Valve with M4 port	SS	0.12	340	SLV	M		G4232A 2 Position/10 Port micro valve head, 600 bar	5067-4744
Autosampler	Valve with M4 port	SS	0.12	500	SLV	M		G4234A/B 6 column selector valve, 600/1200 bar	5067-4745
Valve with 10/32 Swagelok port	Heat exchanger	SS	0.12	90	SX	S	Pre-swaged on A and B	G4231A/B 2 Position/6 Port valve head, 600/1200 bar	5067-4649
Valve with M4 port	Heat exchanger	SS	0.12	90	M	SL	Pre-swaged on B	G4232A 2 Position/10 Port micro valve head, 600 bar	5067-5106
Short column	Valve with M4 port	SS	0.12	130	SV	M		G4234A/B 6 column selector valve, 600/1200 bar	5067-4735
Short column	Valve with M4 port	SS	0.12	150	SV	M		G4232A 2 Position/10 Port micro valve head, 600 bar	5067-5104
Long column	Valve with M4 port	SS	0.12	280	SV	M		G4232A 2 Position/10 Port micro valve head, 600 bar	5067-5107
Short column	Valve with Swagelok port	SS	0.12	150	SL	SX	Pre-swaged on B	G4231A/B 2 Position/6 Port valve head, 600/1200 bar	5067-4650
Short column	Valve with 10/32 Swagelok port	SS	0.12	150	SL	SX		G4232B 2 Position/10 Port valve head, 1200 bar	5067-4686
Long column	Valve with Swagelok port	SS	0.12	280	SL	SX	Pre-swaged on B	G4231A/B 2 Position/6 Port valve head, 600/1200 bar	5067-4651
Long column	Valve with Swagelok port	SS	0.12	280	SL	SX		G4232B 2 Position/10 Port valve head, 1200 bar	5067-4687

**Material**

(Continued)

Key	Description
SS	Stainless steel
S	Swagelok 1.6 mm port id
SH	Swagelok 1.6 mm port id, long head
SL	Swagelok 1.6 mm port id, long
SLV	Swagelok 1.6 mm port id, long, 1200 bar
SX	Swagelok 1.6 mm port id, extra-long
M	Metric M4 0.8 mm port id

**Agilent 1290 Valve Head**

From (A)	To (B)	Material	ID (mm)	Length (mm)	Fitting Type From	Fitting Type To	Notes	Valve Information	Part No.
Valve Swagelok port	Detector	SS	0.12	200	SX	S	Pre-swaged on A and B	G4231A/B 2 Position/6 Port valve head, 600/1200 bar	5067-4653
Valve with Swagelok port	Detector	SS	0.12	200	SX	S	Pre-swaged on A	G4232B 2 Position/10 Port valve head, 1200 bar	5067-4689
Valve with M4 port	Detector	SS	0.12	250	M	SLV		G4232A 2 Position/10 Port micro valve head, 600 bar	5067-4746
Heat exchanger	Valve with M4 port	SS	0.17	90	SL	M	Pre-swaged on A	G4232A 2 positions/10 ports valve head, 1200 bar	5067-5109
Column	Valve with M4 port	SS	0.17	90	SV	M		G4232A 2 positions/10 ports valve head, 1200 bar	5067-5110
Column	Valve with M4 port	SS	0.17	150	SV	M		G4232A 2 positions/10 ports valve head, 1200 bar	5067-5111
Column	Valve with M4 port	SS	0.17	280	SV	M		G4232A 2 positions/10 ports valve head, 1200 bar	5067-5112
G4232A 2 positions/10 ports valve head, 1200 bar		SS	0.17	250	SL	M	Pre-swaged on A	G4232A 2 positions/10 ports valve head, 1200 bar	5067-5113

**Agilent 1200 and 1100 Prep LC Systems**

From	To	Material	ID (mm)	Length (mm)	Fitting Type From	Fitting Type To	Notes	Part No.
Prep Isocratic	Autosampler	ST	0.6	400	S	S	Pre-swaged on A and B	G1361-67302
Autosampler	Column	ST	0.5	600	S	S/SX		G2260-87300
Autosampler	Column	ST	0.5	400	S	SH		G2260-87301



Stainless steel fittings (S), 5062-2418



Stainless steel extra long fitting (SX), 5065-9967



1200 bar removable long fitting (SLV), 5067-4738



1200 bar removable fitting (SV), 5067-4733



PEEK fittings, plugs (MP), 5065-4410

Images shown are capillary fittings. For complete information on fittings, turn to page 40.

Miscellaneous Capillaries

Material	ID (mm)	Length (mm)	Fitting Type From (A)	Fitting Type To (B)	OD (mm) A*	OD (mm) B*	Notes	Part No.
SS	0.12	70	S	S	1.6	1.6		G1316-87303
SS	0.12	2000	U	U			Restriction Capillary	5022-2159
SS	0.12	105			1.6	1.6	Capillary without fitting	5021-1820
SS	0.12	400			1.6	1.6	Capillary without fitting	5021-1823
SS	0.12	150			1.6	1.6	Capillary without fitting	5021-1821
SS	0.12	280			1.6	1.6	Capillary without fitting	5021-1822
SS	0.12	500			1.6	1.6	Capillary without fitting	5065-9964
SS	0.12	200			1.6	1.6	Capillary without fitting	5065-9935
SS	0.12	50	S	U	1.6			G1316-87312
SS	0.12	340	S	S	1.6	1.6		G1316-87319
SS	0.12	170	S	S	1.6	1.6		G1316-87316
SS	0.12	300	S	S	1.6	1.6		G1316-87318
SS	0.12	210	S	S	1.6	1.6		G1316-87317
SS	0.12	70	S	U	1.6			G1316-87313
SS	0.12	90	S	U	1.6			G1316-87314
SS	0.12	60	S	S			Pre-swaged on A and B	79841-87610
SS	0.12	340	S	M		0.8	Pre-swaged on A	G1316-87305

\*1.6 mm = 1/16 in

(Continued)

Material

Key	Description
SS	Stainless steel
S	Swagelok 1.6 mm port id
U	Swagelok union
SL	Swagelok 1.6 mm port id, long
SLV	Swagelok 1.6 mm port id, long, 1200 bar
SX	Swagelok 1.6 mm port id, extra-long
M	Metric M4 0.8 mm port id



Stainless steel fittings (S), 5062-2418

Images shown are capillary fittings. For complete information on fittings, turn to page 40.

Miscellaneous Capillaries

Material	ID (mm)	Length (mm)	Fitting Type From (A)	Fitting Type To (B)	OD (mm) A*	OD (mm) B*	Notes	Part No.
SS	0.12	100	M	M	0.8	0.8		G1316-27301
SS	0.12	75	S	M	1.6	0.8		G1316-87306
SS	0.12	90	S	SX	1.6	1.6		5067-4685
SS	0.12	120	SX	SX	1.6	1.6		5067-4688
SS	0.17	105			1.6	1.6	Capillary without fitting	5021-1816
SS	0.17	400			1.6	1.6	Capillary without fitting	5021-1819
SS	0.17	150			1.6	1.6	Capillary without fitting	5021-1817
SS	0.17	280			1.6	1.6	Capillary without fitting	5021-1818
SS	0.17	280	S	S	1.6	1.6	Pre-swaged on A	01090-87304
SS	0.17	200			1.6	1.6	Capillary without fitting	5065-9931
SS	0.17	600			1.6	1.6	Capillary without fitting	5065-9933
SS	0.17	800	S	S	1.6	1.6	Pre-swaged on A	01048-87302
SS	0.17	900			1.6	1.6	Capillary without fitting	5065-9963
SS	0.17	105	S	S	1.6	1.6		G1316-87321
SS	0.17	700			1.6	1.6	Capillary without fitting	5065-9932
SS	0.17	170	S	S	1.6	1.6		G1316-87323
SS	0.17	250	S	S	1.6	1.6	Pre-swaged on A and B	G1367-87304
SS	0.17	150	S	S	1.6	1.6	Pre-swaged on A and B	G1312-87305
SS	0.17	800	SL	S	1.6	1.6	Pre-swaged on A	01078-87305
SS	0.17	105	S	S	1.6	1.6	Pre-swaged on A and B	G1312-87306
SS	0.17	280	SX	S	1.6	1.6	Pre-swaged on A and B	5067-4608
SS	0.17	700	S	SX	1.6	1.6	Pre-swaged on A and B	5067-4648
SS	0.17	150	M	M	0.8	0.8		5067-4737
SS	0.17	700	SL	M	1.6	0.8	Pre-swaged on A	5067-5120

\*1.6 mm = 1/16 in

(Continued)



Stainless steel extra long fitting (SX), 5065-9967



Stainless steel ferrule (M), 5067-1557

Images shown are capillary fittings. For complete information on fittings, turn to page 40.

Miscellaneous Capillaries

Material	ID (mm)	Length (mm)	Fitting Type From (A)	Fitting Type To (B)	OD (mm) A*	OD (mm) B*	Notes	Part No.
SS	0.17	280	SX	SX	1.6	1.6	Pre-swaged on A and B	5067-4607
SS	0.17	280	SX	S	1.6	1.6	Pre-swaged on A and B	5067-4608
SS	0.17	400			1.6	1.6	Capillary without fitting	5021-1819
SS	0.17	500	SX	Nut (P/N 0100-2086)	1.6	1.6	Pre-swaged on A	5067-4609
SS	0.17	600			1.6	1.6	Capillary without fitting	5065-9933
PK/SS	0.17	100			1.6	1.6	Capillary without fitting	5067-4777
PK/SS	0.17	150			1.6	1.6	Capillary without fitting	5067-4778
PK/SS	0.17	200			1.6	1.6	Capillary without fitting	5067-4779
PK/SS	0.17	300			1.6	1.6	Capillary without fitting	5067-4780
PK/SS	0.17	400			1.6	1.6	Capillary without fitting	5067-4781
PK/SS	0.17	500			1.6	1.6	Capillary without fitting	5067-4782
SS	0.25	320	S	S	1.6	1.6	Pre-swaged on A and B	79835-87638
SS	0.5	105			1.6	1.6	Capillary without fitting	5065-9927
SS	0.5	150			1.6	1.6	Capillary without fitting	5022-6509
SS	0.5	200			1.6	1.6	Capillary without fitting	5022-6510
SS	0.5	800			1.6	1.6	Capillary without fitting	5065-9926

\*1.6 mm = 1/16 in

Material

Key	Description
SS	Stainless steel
PK	PEEK
PK/SS	PEEK and Stainless steel
Ti	Titanium
S	Swagelok 1.6 mm port id
U	Swagelok union
SL	Swagelok 1.6 mm port id, long
SLB	Swagelok 1.6 mm port id, long bio
SV	Swagelok 1.6 mm port id, 1200 bar
SLV	Swagelok 1.6 mm port id, long, 1200 bar
SX	Swagelok 1.6 mm port id, extra-long



Stainless steel fittings (S), 5062-2418



Stainless steel extra long fitting (SX), 5065-9967



Stainless steel ferrule (M), 5067-1557

Images shown are capillary fittings. For complete information on fittings, turn to page 40.

Supplies for the Agilent Infinity 1260 Bio-inert LC System

From (A)	To (B)	Material	ID (mm)	Length (mm)	Fitting Type From	Fitting Type To	Notes	Part No.
Pump	Thermostatted autosampler	Ti	0.17	700	SLB	SLV	Pre-swaged on A	G5611-60501
Pump	Manual injection valve	Ti	0.17	900	SLB	SLV	Pre-swaged on A	G5611-60502
Pump	Injector	Ti	0.17	400	SLB	SLV	Pre-swaged on A	G5611-60500
Injector	Detector	PK/SS	0.17	400	SV	SV		G5667-60500
Manual injector	Detector	PK/SS	0.17	500	SV	SV		G5667-60501
Autosampler injection valve	Autosampler analytical head	Ti	0.17	160	SLB	SV	Pre-swagged on A	G5611-60503
Damper	Pump head	Ti	0.6	234	SLB	SLB	For pump only. Pre-swaged on A and B	G5611-67301
Outlet ball valve	Damper	Ti	0.6	248	SLB	SLB	For pump only. Pre-swaged on A and B	G5611-67300
Autosampler injection valve	Column	PK/SS	0.17	100	SV	SV	Included in the Bio Capillary starter kit; used for 2 position/6 port and 4 column selector valve	G5667-60502
Autosampler injection valve	Column	PK/SS	0.17	150	SV	SV	Included in the Bio Capillary starter kit	G5667-60503
Autosampler injection valve	Column	PK/SS	0.17	200	SV	SV	Included in the Bio Capillary starter kit	G5667-60504
Autosampler injection valve	Column	PK/SS	0.17	300	SV	SV	Included in the Bio Capillary starter kit; used for 2 position/6 port and 4 column selector valve	G5667-60505
Autosampler injection valve	Column	PK/SS	0.17		SV	SV	Bio-inert Low Dispersion Heat exchanger	G5616-60050



1200 bar removable fitting (SV),  
5067-4733



1200 bar removable long fitting (SLV),  
5067-4738



Titanium fitting (SLB),  
G5611-60502



Bio-inert Low Dispersion  
Heat Exchanger, G5616-60050

Images shown are capillary fittings. For complete information on fittings, turn to page 40.

**PEEK Coated Fused Silica Capillaries for Nano LC**

From (A)	To (B)	Material	ID (mm)	Length (mm)	Fitting Type From	Fitting Type To	Part No.
Switching valve	Column	FS/PK	25	100	MP	WPF	G1375-87320
EMPV	Flow sensor	FS/PK	25	220	WG	MP/WG	G1375-87321
Flow sensor	Injection valve	FS/PK	25	350	MP/WG	MP	G1375-87322
Switching valve	Column	FS/PK	25	550	MP	WPF	G1375-87323
Switching valve	Column	FS/PK	25	550	MP	WPF	G1375-87323
Switching valve	Column	FS/PK	25	700	MP	WPF	G1375-87324
Switching valve	Column	FS/PK	50	100	MP	WPF	G1375-87325
Injection valve	Injector seat or to 2nd pump	FS/PK	75	650	MP	WG/WPF	G1375-87327

**PEEK Coated Fused Silica Capillaries – 20 µL/min Flow**

From (A)	To (B)	Material	ID (mm)	Length (mm)	Fitting Type From	Fitting Type To	Part No.
EMPV	Flow sensor	FS/PK	50	220	WG	WG	G1375-87301
Flow sensor	Injection valve	FS/PK	50	550	WG	MP	G1375-87310
Injection valve	Metering device	FS/PK	50	200	MP	WG	G1375-87302
Injection valve	Column	FS/PK	50	500	MP	WPF	G1375-87304
Column	Detector	FS/PK	50	400	WPF		G1315-68703
Detector	Waste	FS/PK	75	700			G1315-68708
µ-switching valve	Column	FS/PK	50	280	MP	WPF	G1375-87309



Stainless steel fittings, male (G), 5063-6593



Ferrule and stainless steel lock ring (W), 5065-4423



PEEK fittings, plugs (MP), 5065-4410



Double winged PEEK nut & ferrule (WPF), 5065-4422



Images shown are capillary fittings. For complete information on fittings, turn to page 40.

PEEK Coated Fused Silica Capillaries – 100 µL/min Flow

From (A)	To (B)	Material	ID (mm)	Length (mm)	Fitting Type From	Fitting Type To	Part No.
EMPV	Flow sensor	FS/PK	100	220	WG	WG	G1375-87305
Flow sensor	Injection valve	FS/PK	100	550	WG	MP	G1375-87306
Injection valve	Metering device	FS/PK	100	200	MP	WG	G1375-87312
Injection valve	Column	FS/PK	75	500	MP	WPF	G1375-87311
Column	Detector	FS/PK	75	400	WPF		G1375-87308
Detector	Waste	FS/PK	75	700			G1315-68708
µ-switching valve	Column	FS/PK	50	280	MP	WPF	G1375-87309

Loop Capillaries

Volume (µL)	Agilent Autosampler	Part No.
8	G1389A	G1375-87303
	G1377A	G1375-87315
20	G1367E, G4226A	G4226-60310
40	G1367D	G1377-87310
	G1367E, G4226A	5067-4703
	G1377A	G1377-87300
	G1389A	G1329-87302
100	G1313A, G1329A/B, 1120, 1220 Infinity LC	01078-87302
	G1367A/B/C	G1367-87300
	G1367E, G4226A	5067-4710
	G5667A	G5667-60310
900	G1329A/B, G2260A	G1313-87303
5000	G2260A	G2260-68711

Material

Key	Description
FS/PK	Fused silica/PEEK
W	Swagelok 0.8 mm port id
WG	Swagelok 0.8 mm port id, small head SW 4 mm
MP	Metric M4 0.8 mm port id, PEEK
WPF	Swagelok 0.8 mm port id, PEEK, finger-tight



**Agilent 1220/1120 Infinity Series LC**

From (A)	To (B)	Material	ID (mm)	Length (mm)	Fitting Type From	Fitting Type To	Notes	Part No.
Pump	Autosampler	SS	0.17	380	S	S	Pre-swaged on A and B	01090-87306
Manual injector	Column	SS	0.17	180	S	S	Pre-swaged on A	G1313-87305
Heater	Column	SS	0.17	90	S	S		G1316-87300
Column	Detector	SS	0.17	380	S	S	Pre-swaged on A; thermal isolation	G1315-87311
VWD	Waste	PK	0.25	500			Finger-tight fittings not included (0100-1516, 2/pk)	5062-8535
Detector	Waste	PTFE	0.8	500			Finger-tight fittings not included (0100-1516, 2/pk)	5062-2462

**Material**

Key	Description
SS	Stainless steel
S	Swagelok 1.6 mm port id
PK	PEEK
PTFE	PTFE



Stainless steel fittings (S), 5062-2418



Finger-tight PEEK fitting (SPF), 0100-1516



Images shown are capillary fittings. For complete information on fittings, turn to page 40.

# Tubing

## PEEK Tubing

- Flexible and easy to cut to desired lengths
- Color coded for easy tracking
- Accepts both stainless steel and PEEK fittings
- 1/16 in od

### PEEK Tubing

ID (mm)	Length (m)	Color Code	Part No.
0.50	1.5	Orange	0890-1761
0.25	1.5	Blue	0890-1762
0.25	5	Blue	5042-6463
0.18	1.5	Yellow	0890-1763
0.18	5	Yellow	5042-6462
0.13	1.5	Red	0890-1915
0.13	5	Red	5042-6461

### Other Tubing

Description	Length (m)	ID (mm)	OD (mm)	Part No.
PTFE tubing, FEP, primary use for valve solutions	5	0.7	1.6	5062-2462
PTFE solvent tubing, primary use for flow path from solvent bottle to degasser, to pump	5	1.5	3.1	5062-2483
Corrugated tubing, polypropylene	5	6.5		5062-2463
Silicone tubing	5	1	3	5065-9978
Clamps and micro clamps, 10/pk				5065-9976
Barbed Y-Connector PP for 3/16 in id tube, 10/pk				5065-9971
<b>For G2258A 1100/1200 Series Dual Loop Autosampler</b>				
Front seat tube, SS	0.1	0.5		G2258-87316
Back seat tube, SS	0.12	0.5		G2258-87315
Front seat tube, PTFE	0.1	0.2		G2258-87312
Back seat tube, PTFE	0.12	0.25		G2258-87313
Waste tube	0.15	0.8		G2258-87310
Waste tube	0.1	0.8		G2258-87311
Drawing tube assembly for flush solvent				G2258-87307
Tubing assembly, solvent flush				G2258-87314
<b>For G1313/27/29A 1100/1200 Series Autosampler</b>				
Waste tube				G1313-87300
Corrugated tubing, polypropylene	5	6.5		5062-2463
<b>For G1387A 1100/1200 Series Micro Autosampler</b>				
Waste tube, FEP		0.8	1.6	G1375-87326

**Accessories**

Description	Part No.
Plastic tubing cutter	8710-1930
Blades for plastic cutter, 5/pk	8710-1931
Fitting screws, stainless steel, 10-32, 4 mm, 5/pk	5065-9948
PEEK ferrule and stainless steel ring for 2 mm tube, 5/pk	5065-9950
Union, PEEK for 1/8 in od tubing	0100-2410
Waste adapter, 1200 Series autosamplers, gray	G1313-43216



Plastic tubing cutter, 8710-1930

**Rigid Capillary Tubing**

- Squarely cut, pre-cleaned and ready to use
- Use with stainless steel fittings and ferrules (P/N 5062-2418) or PEEK fittings (P/N 0100-1516)

**Rigid Capillary Tubing**

Length (mm)	ID (mm)	Unit	Part No.
100	0.17	10/pk	5061-3361
200	0.17	10/pk	5061-3362



Fitting screws, 5065-9948



PEEK ferrules and SS rings, 5065-9950



## Fittings and Unions

### Your best value: Agilent multi-use capillary and fitting kits with FREE cybertool

Agilent starter kits contain the most widely used capillary tubing, Swagelok connectors, and fittings in a variety of sizes, so you can find just the right length to minimize your connections and tubing volume. We've also included our flexible stainless steel capillaries to help you make the best LC connections, regardless of equipment brand. Plus, as a special bonus, all multi-use kits (the first three listed here) feature a FREE cybertool that puts more than 30 lab essentials at your fingertips.

For high-efficiency columns, it's best to use narrow-diameter red tubing (0.12 mm id), instead of conventional green (0.17 mm id) tubing.

#### Capillary and fittings kits

Description	Contents	Part No.
Capillary/fitting starter kit for 1100 Capillary LC System Multi-use kit, a collection of various capillaries and tools for use in the lab.	Kit includes: Qty 2 – Fused silica/PEEK capillary, 50 µm, 55 cm Qty 1 – Fused silica/PEEK capillary, 50 µm, 20 cm Qty 1 – Fused silica/PEEK capillary, 100 µm, 110 cm Qty 2 – Fused silica/PEEK capillary, 50 µm, 50 cm Qty 2 – Fused silica/PEEK capillary, 50 µm, 40 cm Qty 4 – 4 mm stainless steel fitting, male 10-32 Qty 4 – 1/32 in PEEK ferrule and stainless steel lock ring Qty 4 – PEEK fittings for µ-valves Qty 4 – Double winged PEEK nuts and 1/32 in ferrules Cybertool	5065-9938
Capillary/fitting starter kit, 0.12 mm id Multi-use kit, a collection of various capillaries and tools for use in the lab.	Kit includes: Qty 1 – PEEK capillary, 0.13 mm id, 1.5 m Qty 4 – Stainless steel capillary, 0.12 x 105 mm Qty 4 – Stainless steel capillary, 0.12 x 150 mm Qty 2 – Stainless steel capillary, 0.12 x 170 mm Qty 2 – Stainless steel capillary, 0.12 x 200 mm Qty 2 – Stainless steel capillary, 0.12 x 220 mm Qty 2 – Stainless steel capillary, 0.12 x 280 mm Qty 1 – Stainless steel capillary, 0.12 x 400 mm Qty 3 – Stainless steel ZDV union Tubing cutter for PEEK capillaries 1/16 in Stainless steel fittings, 10/pk 1/16 in PEEK fittings, color, 10/pk 1/16 in PEEK fittings, 10/pk Rheotool Cybertool	5065-9937

(Continued)

## Capillary and fittings kits

Description	Contents	Part No.
Capillary/fitting starter kit, 0.17 mm id Multi-use kit, a collection of various capillaries and tools for use in the lab.	Kit includes: Qty 1 – PEEK capillary, 0.18 mm id, 1.5 m Qty 4 – Stainless steel capillary, 0.17 x 105 mm Qty 4 – Stainless steel capillary, 0.17 x 150 mm Qty 2 – Stainless steel capillary, 0.17 x 200 mm Qty 2 – Stainless steel capillary, 0.17 x 280 mm Qty 1 – Stainless steel capillary, 0.17 x 400 mm Qty 3 – Stainless steel ZDV union Tubing cutter for PEEK capillaries 1/16 in Stainless steel fittings, 10/pk 1/16 in PEEK fittings, color, 10/pk 1/16 in PEEK fittings, 10/pk Rheotool Cybertool	5065-9939
Capillary starter kit, 0.17 mm BIO	Kit includes: Qty 1 – 1.5 m PEEK tubing PEEK finger-tight fitting, 10/pk Colored finger-tight PEEK fittings, 10/pk Qty 3 – Bio-inert union, 600 bar Qty 1 – Plastic tubing cutter Qty 1 – Rheotool socket wrench, 1/4 in Qty 1 – Ti capillary, 0.17 x 400 mm Qty 2 – PK/SS capillary, 0.17 x 105 mm Qty 2 – PK/SS capillary, 0.17 x 150 mm Qty 1 – PK/SS capillary, 0.17 x 300 mm Qty 2 – PK/SS capillary, 0.17 x 200 mm Multifunction tool	G5611-68710
Rapid Resolution High Throughput capillary kit Used for converting an Agilent 1200 instrument to the RRLC configuration, to enable use of high efficiency columns (to 600 bar). Can also be used for Agilent 1100 instruments.	Kit includes: Qty 1 – PEEK fitting long for 1/32 in od capillaries Qty 1 – Stainless steel capillary, 0.12 x 280 mm Qty 1 – Stainless steel capillary, 0.12 x 150 mm Qty 1 – Stainless steel capillary, 0.12 x 70 mm Qty 1 – Needle seat capillary, 12 µL x 0.12 mm Qty 1 – PEEK capillary, 0.125 x 550 mm	5065-9947
Low dispersion capillary kit for G1316C	Kit includes: Qty 1 – Flexible tubing, 280 mm, 0.12 mm id Qty 1 – Heater Long Down 0.12 id (1.6 µL internal) Qty 1 – Carrier for heat exchanger TCC SL Plus	5067-4633

(Continued)

Capillary and fittings kits

Description	Contents	Part No.
1200 Infinity Series capillary kit 0.12 mm id, G1316C for installing valves G4231A (2 position/6 ports – 600 bar) and G4231B (2 position/6 ports – 1200 bar)	Kit includes: Qty 1 – Column clip set,eight colors Qty 1 – Stainless steel capillary 0.12 x 340 mm Qty 1 – Stainless steel capillary 0.17 x 700 mm Qty 2 – Stainless steel capillary 0.12 x 90 mm Qty 2 – Stainless steel capillary 0.12 x 150 mm Qty 2 – Stainless steel capillary 0.12 x 280 mm Qty 1 – Stainless steel capillary 0.12 x 120 mm Qty 1 – Stainless steel capillary 0.12 x 200 mm Qty 1 – Heater Long Up 0.12 id (1.6 µL internal) Qty 1 – Heater Long Down 0.12 id (1.6 µL internal) Qty 2 – Carrier for heat exchanger TCC SL Plus	5067-4646
1200 Infinity Series capillary kit 0.17 mm id G1316C for installing a 2 position/10 port valve G4232A (600 bar)	Kit includes: Qty 2 – PEEK tubing, 1/32 in od, 0.4 mm id, 450 mm Qty 1 – Column clip set,eight colors Qty 3 – Stainless steel capillary 0.17 x 150 mm Qty 1 – Stainless steel capillary 0.17 x 340 mm Qty 4 – Stainless steel capillary 0.17 x 90 mm Qty 2 – Stainless steel capillary 0.17 x 280 mm Qty 1 – Stainless steel capillary 0.17 x 250 mm Qty 1 – Stainless steel capillary 0.17 x 700 mm	5067-5103
1200 Infinity Series capillary kit 0.12 mm id G1316C for installing a 2 position/10 port valve G4232B (1200 bar)	Kit includes: Qty 1 – Stainless steel capillary 0.12 x 120 mm Qty 2 – Stainless steel capillary 0.12 x 150 mm Qty 1 – Stainless steel capillary 0.12 x 200 mm Qty 2 – Stainless steel capillary 0.12 x 280 mm Qty 1 – Stainless steel capillary 0.12 x 340 mm Qty 1 – Stainless steel capillary 0.17 x 700 mm Qty 2 – Stainless steel capillary 0.12 x 90 mm Qty 1 – Column clip set,eight colors Qty 1 – Heater Long Up 0.12 id (1.6 µL internal) Qty 1 – Heater Long Down 0.12 id (1.6 µL internal) Qty 2 – Carrier for heat exchanger TCC SL Plus	5067-4682
1200 capillary kit for 0.12 mm id	Kit includes: Qty 1 – Stainless steel capillary, 0.12 x 130 mm Qty 2 – Stainless steel capillary, 0.12 x 170 mm Qty 1 – Stainless steel capillary, 0.12 x 210 mm Qty 1 – Stainless steel capillary, 0.12 x 300 mm Qty 3 – Stainless steel capillary, 0.12 x 500 mm Qty 1 – Stainless steel capillary, 0.12 x 700 mm Qty 1 – Stainless steel capillary, 0.12 x 340 mm Qty 1 – Low carry over seat Qty 1 – DAD heat exchanger capillary, 0.12 x 310 mm	G1316-68716

(Continued)



**Capillary and fittings kits**

Description	Contents	Part No.
Stainless steel flexible capillary tubing kit	Kit includes: Qty 10 – 1.6 mm (1/16 in) Stainless steel back ferrules Qty 10 – 1.6 mm (1/16 in) Stainless steel front ferrules Qty 10 – Stainless steel fittings Qty 3 – Stainless steel Swagelok nut, 0.12 x 105 mm Qty 1 – Stainless steel capillary, 0.12 x 150 mm Qty 1 – Stainless steel capillary, 0.12 x 280 mm	5061-3304
Stainless steel flexible capillary tubing kit	Kit includes: Qty 2 – Stainless steel capillary, 0.12 x 35 mm Qty 3 – Stainless steel capillary, 0.12 x 105 mm Qty 1 – Stainless steel capillary, 0.12 x 280 mm	5061-3315
1200 Infinity Series low dispersion capillary kit for installing a 6 position/14 port valve G4234A (600 bar) and G4234B (1200 bar)	Kit includes: Qty 1 – Stainless steel capillary, 0.12 x 250 mm, with removable fitting Qty 1 – Stainless steel capillary, 0.12 x 340 mm, with removable fitting Qty 1 – Stainless steel capillary, 0.12 x 500 mm, with removable fitting Qty 8 – Stainless steel capillary, 0.12 x 130 mm, with removable fitting Qty 1 – Stainless steel capillary, 0.17 x 150 mm, with 2 long pre-swaged fittings Qty 4 – Stainless steel capillary, 0.12 x 170 mm Qty 2 – PEEK tubing, 1/32 in od, 0.4 mm id, 450 mm Qty 2 – PEEK fitting, special for Chip-LC Qty 1 – Column clip set, eight colors Qty 2 – Heater Long Up 0.12 mm id (1.6 µL internal) Qty 2 – Heater Long Down 0.12 mm id (1.6 µL internal) Qty 2 – Carrier for heat exchanger TCC Qty 2 – Fitting holder assembly	5067-4729
Ultra-low dispersion capillary kit for the 1290 Infinity LC	Kit includes: Qty 1 – Stainless steel capillary, 0.075 x 220 mm SV/SLV Qty 1 – Stainless steel capillary, 0.075 x 340 mm SV/SLV Qty 1 – Low dispersion needle seat for 1290 Infinity LC Qty 1 – Heater Long Up 0.075 mm (nominal 1.0 µL) Qty 1 – 1290 Infinity LC Low Dispersion Kit Note	5067-5189



Ultra-low dispersion capillary kit, 5067-5189



Stainless steel fittings (S),  
5062-2418



PEEK fittings (SPF),  
0100-1516/5063-6591



Stainless steel long fittings (SL),  
5065-4454



Finger-tight PEEK fitting (SPF),  
0100-1516



Stainless steel extra long fitting (SX),  
5065-9967



PEEK long fittings (SPFL),  
5062-8541



Stainless steel nut,  
5061-3303



Finger-tight PEEK fittings (SPF),  
5065-4426



Stainless steel front ferrules,  
5180-4108



Double winged fitting (SPF),  
5042-6500



Stainless steel back ferrules,  
5180-4114



PEEK RheFlex fittings (SPF),  
0100-1631



1200 bar removable fitting (SV),  
5067-4733



PEEK RheFlex fittings (SPF),  
0100-2175



1200 bar removable long fitting (SLV),  
5067-4738



Stainless steel blanking nut,  
01080-83202



1200 bar removable extra long fitting  
(SXV), 5067-4739

### Fittings

Description	Key	Unit	Part No.
Swagelok 1.6 mm stainless steel fitting	S	10/pk	5062-2418
Swagelok 1.6 mm stainless steel fitting, long screw	SL	10/pk	5065-4454
Swagelok 1.6 mm stainless steel fitting, extra long screw	SX	10/pk	5065-9967
Swagelok 1.6 mm screw		10/pk	5061-3303
1.6 mm stainless steel front ferrule		10/pk	5180-4108
1.6 mm stainless steel back ferrule		10/pk	5180-4114
Swagelok 1.6 mm 1200 bar removable fitting	SV	1/ea	5067-4733
Swagelok 1.6 mm 1200 bar removable fitting, long screw	SLV	1/ea	5067-4738
Swagelok 1.6 mm 1200 bar removable fitting, extra long screw	SXV	1/ea	5067-4739
Swagelok 1.6 mm finger-tight PEEK fitting	SPF	10/pk	5063-6591
Swagelok 1.6 mm PEEK finger-tight fitting	SPF	2/pk	0100-1516
Swagelok 1.6 mm PEEK finger-tight long fitting	SPLF	10/pk	5062-8541
Swagelok 1.6 mm PEEK finger-tight fitting (mixed colors)	SPF	10/pk	5065-4426
Swagelok 1.6 mm finger-tight PEEK double winged fitting	SPF	10/pk	5042-6500
Swagelok 1.6 mm finger-tight PEEK Rheflex fitting	SPF	5/pk	0100-1631
Swagelok 1.6 mm finger-tight PEEK Rheflex fitting (mixed color)	SPF	10/pk	0100-2175
Swagelok 1.6 mm stainless steel blanking nut	S	1/ea	01080-83202

### Material

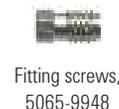
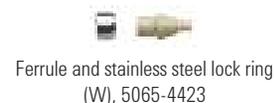
Key	Description
S	Swagelok 1.6 mm port id
SL	Swagelok 1.6 mm port id, long
SX	Swagelok 1.6 mm port id, extra-long
SV	Swagelok 1.6 mm port id, 1200 bar
SLV	Swagelok 1.6 mm port id, long, 1200 bar
SLB	Swagelok 1.6 mm port id, long bio
SXV	Swagelok 1.6 mm port id, extra-long, 1200 bar
SPF	Swagelok 1.6 mm port id, PEEK, finger-tight
SPLF	Swagelok 1.6 mm port id, PEEK, long, finger-tight

**Fittings**

Description	Key	Unit	Part No.
Swagelok 1.6 mm stainless steel screw for PEEK ferrule 5067-1547	S	6/pk	5067-1540
Swagelok stainless steel screw with 1.6 mm PEEK ferrule	SP	1/ea	0100-2086
1.6 mm PEEK ferrule for 5067-1540 screw	SP	6/pk	5067-1547
Swagelok 1.6 mm finger-tight polyketone fitting	SPF	10/pk	5042-8957
M4 stainless steel screw for stainless steel ferrule 5067-1558	M	6/pk	5067-1558
0.8 mm stainless steel ferrule for 5067-1558 screw	M	6/pk	5067-1557
Swagelok 1.6 mm plastic blank nut	M	1/ea	0100-1259
Swagelok 1.6 mm ST screw, 4 mm head	G	10/pk	5063-6593
0.8 mm PEEK ferrule and stainless steel ring for 5063-6593 screw	W	10/pk	5065-4423
M4 0.8 mm PEEK fitting	MP	6 fittings, 2 plugs	5065-4410
Swagelok 0.8 mm finger-tight PEEK double winged fitting	WPF	10/pk	5065-4422
Swagelok 0.8 mm finger-tight PEEK long fitting	WPFL	1/ea	5022-6536
Swagelok 2.0 mm stainless steel screw, 4 mm head		5/pk	5065-9948
2.0 mm PEEK ferrule and stainless steel ring		5/pk	5065-9950

**Material**

Key	Description
S	Swagelok 1.6 mm port id
SP	Swagelok 1.6 mm port id, PEEK
SPF	Swagelok 1.6 mm port id, PEEK, finger-tight
W	Swagelok 0.8 mm port id
G	Small head SW 4 mm
WG	Swagelok 0.8 mm port id, small head SW 4 mm
MP	Metric M4 0.8 mm port id, PEEK
WPF	Swagelok 0.8 mm port id, PEEK, finger-tight





ZDV union, 5022-2145



Adapter, PEEK, 0100-2298



ZDV universal union, 5022-2184



Barbed Y-connector PP, 5065-9971



ZDV union with fittings, 0100-0900



Union, female to female, 5042-8517



ZDV union, PEEK with fittings, 0100-2441



High flow union, 5022-2133



Adapter, male Luer to female, 5042-8518



PEEK adapter, 0100-1847



Adapter, female to male, 5023-1803



Bio-inert union, 600 bar, 5067-4741



Micro T-connector, PEEK, 5042-8519

**Unions**

Description	Use With	Part No.
ZDV union, no fittings	Nano LC	5022-2145
ZDV universal union, stainless steel, no fittings	Standard LC	5022-2184
ZDV union, with fittings	Standard LC	0100-0900
ZDV union, PEEK with fittings	Bio-applications	0100-2441
High flow union, no fittings	Prep LC	5022-2133
PEEK adapter 1/4-28 to 10-32		0100-1847
Adapter, PEEK int. 1/4-28 to ext. 10-32		0100-2298
Barbed Y-connector PP for 3/16 in id tube, 10/pk		5065-9971
Adapter, union PEEK 1/4-28		5042-8517
Adapter, male Luer to female 1/4-28		5042-8518
SS adapter Swagelok to 1/4-28		5023-1803
T-connector, PEEK, swept volume 0.57 µL	For 1/16 in od tubing	5022-2144
Micro T-connector, PEEK, swept volume 29 mL, with 1/32 in id fittings		5042-8519
Bio-inert union, stainless steel with PEEK insert 600 bar	Bio-applications	5067-4741

# Tips and tools for creating the best possible connections

## How do I tighten fittings correctly?

The chart below describes the steps you'll need to follow.

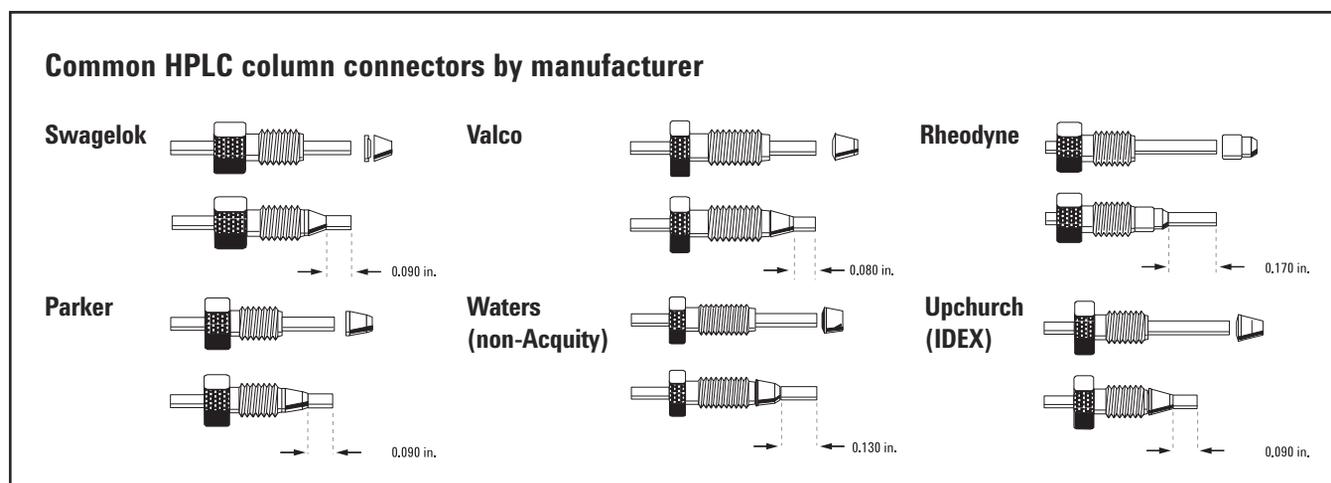


Fitting type	First Connection	Further connection
Stainless steel	<ol style="list-style-type: none"> <li>1. Slide the screw, along with the back and front ferrules, onto the capillary.</li> <li>2. Insert capillary into the port until it is completely seated in the end fitting.</li> <li>3. Finger-tighten the nut until the capillary does not rotate.</li> <li>4. Tighten the nut ½ to ¾ turn with a slitted socket wrench or Rheotool (P/N 8710-2391). If you are using a torque wrench, tightening torque should be between 1.5 and 3.0 Nm)</li> </ol>	Finger-tighten, then tighten an extra ¼ to ½ turn with a slitted socket wrench or Rheotool (P/N 8710-2391). (If using a torque wrench, tightening torque should be between 1.5 and 3.0 Nm).
Polymeric finger-tight: PEEK and polyketone	<ol style="list-style-type: none"> <li>1. Slide the screw and ferrule onto the capillary.</li> <li>2. Insert capillary into the port until it is completely seated in the end fitting.</li> <li>3. Finger-tighten the nut until the capillary does not rotate.</li> <li>4. Make sure the capillary cannot be easily pulled out.</li> </ol>	<p>Additional tightening if necessary</p> <p>See "good connections" step by step</p>
1200 bar removable fitting	<ol style="list-style-type: none"> <li>1. Slide the screw, along with the back and front ferrules, onto the capillary.</li> <li>2. Insert capillary into the port until it is completely seated in the end fitting.</li> <li>3. Finger-tighten the nut until the capillary does not rotate.</li> <li>4. Tighten the nut about ¾ turn with a socket wrench.</li> <li>5. For stainless steel capillaries, if using a torque wrench, tightening torque should be between 1.0 and 1.2 Nm.</li> <li>6. For stainless steel coated PEEK capillaries, do not exceed 0.8 Nm.</li> </ol>	<p>Finger-tighten, then tighten an extra ¼ to ½ turn with a socket wrench.</p> <p>For stainless steel capillaries, if using a torque wrench, tightening torque should be between 1.0 and 1.2 Nm.</p> <p>For stainless steel coated PEEK capillaries, if using a torque wrench, do not exceed 0.8 Nm.</p>
PEEK/stainless steel	<ol style="list-style-type: none"> <li>1. Slide the screw, along with the back and front ferrules, onto the capillary.</li> <li>2. Insert capillary into the port until it is completely seated in the end fitting.</li> <li>3. Finger-tighten the nut until the capillary does not rotate.</li> <li>4. Tighten the nut about ½ turn with a socket wrench.</li> </ol>	Finger-tighten, then tighten an extra ¼ to ½ turn with a socket wrench.

## How do I prepare the perfect fitting connection?

Problems with stainless steel tubing connections are commonly mistaken for column issues – and are the source of many calls to Agilent’s technical support line.

Connection problems often arise because different manufacturers supply different types of fittings, as you can see in the following diagram:



Ideally, you should use the fittings recommended by your column manufacturer. Most analytical reversed phase columns are compatible with Swagelok or Parker-type fittings when correctly seated in the column.

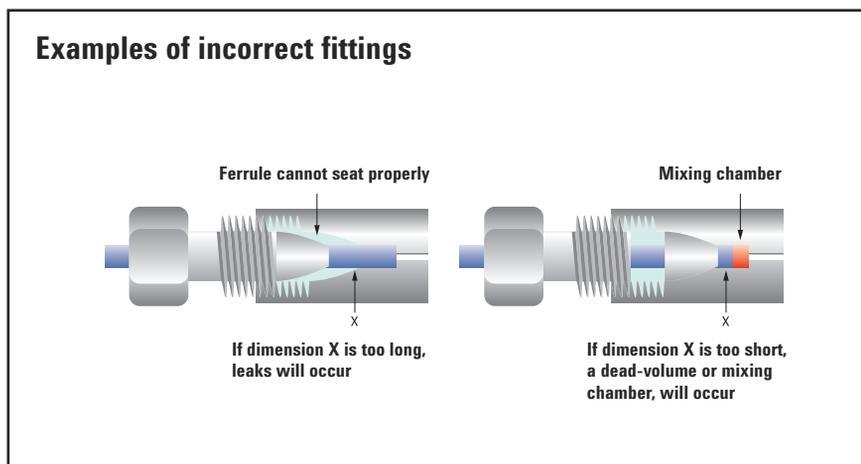
Stainless steel fittings are the best choice for permanent, high-pressure sealing. Agilent recommends Swagelok-type fittings with front and back ferrules, because they deliver the best performance for Agilent LC systems – and can be used on most instrument connections, including valves, heaters, and column connections.

For lower-pressure operation, finger-tight polymeric fittings allow you to easily adjust the end-fitting to seat the capillary into the column properly – helping avoid extra-column voids and leaks. These connectors can be tightened without wrenches. High-pressure fittings, which are designed to be removed and resealed, are also available for pressures up to 1200 bar.

## How do I align the connection properly?

The importance of correct tubing length (relative to the distance from the end of the tubing to the bottom of the ferrule) cannot be overstated. If the tubing is too long, the ferrule will not seat properly and leaks will occur. Likewise, if the tubing is not pushed in far enough, a void occurs, creating extra-column volume that acts as a "mixing chamber", which can cause peak tailing, and/or poor peak shape.

Always make sure you use the correct fittings, and that all fittings are properly seated in the column end fitting – especially if you use columns from different manufacturers.



## A good connection, step by step

This connection uses a Swagelok-type fitting which is good for connections to the instrument. For column connections, it is ideal to use polymeric finger-tight fittings, which are removable, or the 1200 bar removable fitting.

1. Select a nut that is long enough for the fitting you'll be using.
2. Slide the nut over the end of the tubing.
3. Carefully slide the ferrule components on after the nut, then finger-tighten the assembly while making sure the tubing is completely seated in the bottom of the end fitting.
4. Use a wrench to gently tighten the fitting; this will force the ferrule to seat onto the tubing,  $\frac{1}{2}$  to  $\frac{3}{4}$  turn with a wrench. Do not over-tighten! That will shorten the useful life of the fitting.
5. Once you are sure your fitting is complete, loosen the nut and inspect the ferrule for correct position on the tubing.

**Note:** Avoid re-using a capillary on a different location. The position of the fitting is done the first time it is screwed on a port and all the ports are not strictly identical.



## What are the benefits of a small internal diameter?

The roughness of the internal capillary surface is a function of the capillary's outer diameter. A smaller outer diameter provides better smoothness for the internal capillary surface.

Agilent's unique stainless steel LC capillary connections for liquid chromatography are designed for small inner diameters, reducing backpressure and blocking. To make these connections compatible with standard 1/16 in capillaries, we weld a tight, flat sleeve at both ends. Agilent's unique laser welding process ensures that the capillary ends are absolutely flat, eliminating any chance of additional dead volume.

## Which capillary connection size is right for me?

Choose the shortest practical length and narrowest diameter that your application and system allows. For 4.6 mm id columns, 0.17 mm capillaries are usually sufficient, but for narrower id columns like 2.1 mm, 0.12 mm id capillaries are used to keep sample dispersion as low as possible. There are also new ultra-low dispersion capillaries (0.075 mm id) for use with the 1290 Infinity LC.

## How can I get rid of extra-column volume effects?

Extra-column volume effects can be caused by capillaries that are too long, so try a shorter- length capillary. For low-volume, high efficiency columns (e.g., Agilent ZORBAX Eclipse Plus C18, 2.1 x 50 mm, 1.8  $\mu$ m), replace 0.17 mm id (green) capillaries with 0.12 mm id (red).

For additional information on extra-column volume and its effect, see our application note "*Reduce Tubing Volume to Optimize Column Performance*" at [www.agilent.com/chem/library/applications/5990-4964EN.pdf](http://www.agilent.com/chem/library/applications/5990-4964EN.pdf)

## What should I do about high backpressure?

High backpressure issues are usually not caused by capillaries. However, you should check to make sure the capillary isn't blocked, and replace if necessary, as part of your troubleshooting.

## How can I reduce peak broadening, related to my capillary?

In addition to optimizing the length and diameter of the capillary, proper positioning in the fitting is important. The distance between the end of the capillary and the bottom of the ferrule may be too long or too short (creating a void), resulting in a poor connection. This can cause leaks or peak shape issues, such as broadening when the sample mixes in the void. A re-usable fitting can be adjusted, but with stainless steel a new fitting will need to be made.

## How do I eliminate detector spikes and bubbles?

Check for air leaks at the capillary connections, and tighten as needed.

## Pump Supplies

Regular pump maintenance helps lower operating costs and generate precise results that make you feel confident.

You can count on Agilent isocratic, binary, quaternary, capillary, and preparative pumps for superior flow and composition stability. And by following a regular maintenance routine, you can also count on maximum uptime and a steady, accurate solvent flow for the life of the pump.



Sapphire piston and seals

## Pump Routine Maintenance Procedures

- Replace the seals and pistons
- Replace the PTFE frit
- Replace the cartridge in the Active Inlet Valve
- Clean the outlet ball valve
- Clean or replace the solvent inlet frits

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



### Pump Routine Maintenance Procedures

Symptom	Cause	Solution
Solvent dripping out of waste outlet when valve closed	Leak on pump head	Exchange the purge valve frit or the purge valve
Pressure ripple unstable	Dirty active inlet valve cartridge	Run leak test for verification and exchange the active inlet valve cartridge
	Leak on pump head	Run leak test for verification and exchange the outlet ball valve sieve or the complete valve
Gradient performance problems, intermittent pressure fluctuations	Solvent filter is blocked	Change the solvent filter
A pressure drop of >10 bar across the frit (5 mL/min H <sub>2</sub> O with purge valve open) indicates blockage	Dirty frit	Exchange the purge valve frit or the purge valve
Leaks at lower pump head side	High seal wear	Run leak test for verification and exchange the pump seals
Unstable retention time		
Pressure ripple unstable		
Seal lifetime shorter than normally expected	Scratch on plunger	Check plungers while changing the seals
Loss of wash solvent	Leaky wash seals	Exchange the wash seals



Purge valve assembly, G1311-60009



Purge valve with PTFE frit, G4280-60061



PTFE frits, 01018-22707

### Purge Valves

Description	Comments	Part No.
Purge valve with PTFE frit, 400 bar	For G1310A, G1311A, G1312A, G1376A, G2226A	G1311-60009
Purge valve with PTFE frit	For 1120	G4280-60031
Purge valve with PTFE frit	For G1311C, G1312C, 1220	G4280-60061
Purge valve with PTFE frit	For G1310B, G1311B, G1312B, G4302A,	G1312-60061
PTFE frit	For G1310A, G1311A, G1312A, G1376A, G2226A, 1120, 1220, 1220, G1310B, G1311B, G1312B, G1311C, G1312C, G4202A	01018-22707
Seal cap	Not suitable for outlet ball valves with integrated seal	5067-4728
Seal for purge valve	For 1120	0905-1192
Purge valve actuator	For 1120	G4280-60033
Bio-inert purge valve	For G5611A	G5611-60061
5 position / 7 port rotor seal	For G4220A, G4220B	5068-0005
5 position / 7 port stator	For G4220A, G4220B	5068-0004
Multi purpose valve head	For G4204A	5067-4174
Stator for 5067-4174 multi purpose valve head	For G4204A	5068-0122
Rotor for 5067-4174 multi purpose valve head	G4204A	5068-0123
Stainless steel filter assembly with PEEK ring, 2 µm pore size	For G1361A	5022-2192
Open end wrench, 14 mm	To remove purge valve	8710-1924



### TIPS & TOOLS

Information on maintenance procedures can be found at [www.agilent.com/chem/LCmaintenancenotes](http://www.agilent.com/chem/LCmaintenancenotes)

## Inlet and Outlet Valves

### Inlet Valves

Description	Comments	Part No.
Active inlet valve without cartridge	For G1310A, G1311A, G1312A, G1376A, G2226A, G1312B, G1312C	G1312-60025
Cartridge for active inlet valve 400 bar	For G1310A, G1311A, G1312A, G1376A, G2226A, G1312C	5062-8562
Cartridge for active inlet valve 600 bar	For G1312B	G1312-60020
Bio-inert active inlet valve	For G5611A	G5611-60025
Bio-inert cartridge for active inlet valve, 600 bar	For G5611A	G5611-60020
Inlet valve for 1290 quaternary pump	For G4204A	G4204-60022*
Valve assemblies (inlet/outlet) for prep pumps	For G1361A	G1361-60012
Passive inlet valve	For G1310B, G1311B, G1311C, 1120, 1220, G4302A	G1312-60066*
Passive inlet valve	For G4220A, G4220B	G4220-60022*
Seal cap	Not suitable for outlet ball valves with integrated seal	5067-4728

\*Inlet valve with integrated seal.

### Outlet Valves

Description	Comments	Part No.
Outlet ball valve	For G1310A, G1311A, G1312A, G1376A, G2226A, 1120, 1220, G1310B, G1311B, G1311C, G1312B, G1312C, G4302A	G1312-60067*
Outlet ball valve	For G4220A, G4220B, G4204A	G4220-60028*
Bio-inert outlet ball valve	For G5611A	G5611-60067*
Valve assemblies (inlet/outlet) for prep pumps	For G1361A	G1361-60012
Seal cap	Not suitable for outlet ball valves with integrated seal	5067-4728

\*Outlet ball valve with integrated seal.



Active inlet valve without cartridge, G1312-60025



Cartridge, 400 bar, 5062-8562



Passive inlet valve, G1312-60066



Seal cap, 5067-4728



Outlet ball valve, G1312-60067



Outlet ball valve, G4220-60028

### TIPS & TOOLS

Information on maintenance procedures can be found at [www.agilent.com/chem/LCmaintenancenotes](http://www.agilent.com/chem/LCmaintenancenotes)





Sapphire piston and seals

## Pistons and Seals

Agilent pistons are made from a high purity, monocrystalline sapphire for maximum durability. Although ceramic pistons can be manufactured at a lower cost, ceramic is a sintered, polycrystalline material, which can cause undesirable variations during the production process. Agilent sapphire pistons are:

- Meticulously cut at just the right angle, making them durable – and long lasting
- Precisely aligned in their stainless steel holder to minimize wear on the piston and seal

Agilent seals are designed to fit snugly around our pistons, and are capable of adapting to a wide range of flow rates and pressures. Agilent piston seals are:

- Spring-loaded and engineered to deliver optimal performance over highly dynamic flow and pressure ranges
- Manufactured from a proprietary polymer blend, and feature a spring made from the same high-quality stainless steel that is used in our pump's flow path

The combination of our piston and seal has undergone extensive testing under temperature stress, with all common HPLC solvents, and in many instruments. More importantly, they yield consistent, reproducible results.

### Pistons

Description	Comments	Part No.
Sapphire plunger	For G5611A, 4302A	5067-4695
Zirconium based ceramic plunger	For G4220A, G4220B, G4204A	5067-4678
Sapphire plunger	For G1310A, G1311A, G1312A, G1376A, G2226A, 1120, 1220, G1310B, G1311B, G1312B, G1311C, G1312C	5063-6586
Sapphire plunger	For G1361A	G1361-22402

**Seals**

Description	Comments	Part No.
Bio-inert piston seal	For G5611A	G5611-21503
Piston seal polyethylene	For G4220A, G4220B, G4204A	0905-1719
Piston seal graphite filled PTFE (reversed-phase) (2/pk)	For G1310A, G1311A, G1312A, G1376A, G2226A, 1120, 1220, G1310B, G1311B, G1312B, G1311C, G1312C, G4302A	5063-6589
Piston seal Polyethylene (normal phase)	For G1310A, G1311A, G1312A, G1376A, G2226A, 1120, 1220, G1310B, G1311B, G1312B, G1311C, G1312C, G4302A	0905-1420
Piston seal	For G1361A	5022-2188



Piston seals, 5063-6589

**Specific parts for 1290 Infinity LC pumps**

Description	Comments	Part No.
Jet Weaver 35 µL/100 µL	For G4220A, G4220B, G4204A	G4220-60006
Jet Weaver 380 µL	For G4220A, G4220B, G4204A	G4220-60012
Clamp for in-line filter	For G4204A	G4204-40000
Outlet filter 1290 quaternary pump	For G4204A	G4204-60004
Inlet valve for flush pump		5067-4717
Outlet valve for flush pump		5067-4716
Tubing kit 270 mm, 2/pk		5067-4661
Tubing kit 140 mm, 2/pk		G4220-60035
Shut-off valve	For G4220A, G4220B, G4204A	5067-4124
Inline pressure relief valve kit	For G4220A, G4220B	G4212-68001
Solvent selection valve bridge tube		5067-4697
Pressure relief valve	For G4220A, G4220B	G4212-60022
PEEK seal for inlet weaver assembly	For G4204A	G4204-40005
Support ring	For G4220A, G4220B	G4220-60015
Seal keeper	For G4220A, G4220B	G4220-60016

**TIPS & TOOLS**

Information on maintenance procedures can be found at [www.agilent.com/chem/LCmaintenancenotes](http://www.agilent.com/chem/LCmaintenancenotes)





Peristaltic pump, 5042-8507



Peristaltic pump with ChemSure tubing, 5065-9952

## Seal Wash

The routine use of highly concentrated buffer solutions (100 mM) will reduce the life of seals and pistons in your pump. Counteract the problem with one of Agilent's seal wash kits, which flush the back of the seal with a wash solvent. **Note:** Water/isopropanol (90/10) is recommended as the wash solvent.

### Seal Wash

Description	Comments	Part No.
Peristaltic pump cassette with silicone tubing	For 1100/1200/1200 RRLC and 1260 Infinity LC pumps	5042-8507
Silicone tubing, 1 mm id, 3 mm od, 5 m		5065-9978
Peristaltic pump with ChemSure tubing	For 1100/1200/1200 RRLC and 1260 Infinity LC pumps	5065-9952
ChemSure tubing for peristaltic pump		5042-8954
<b>Wash Seal and Wash Keeper</b>		
Wash seal	For 1100/1200/1200 RRLC, 1120 and 1260/1220 Infinity LC pumps	0905-1175
Seal keeper	For 1100/1200/1200 RRLC and 1120 pumps	5001-3743
Bio-inert seal keeper	For G5611A LC pump	G5611-26210
Wash seal gasket, 6/pk	For 1100/1200/1200 RRLC, 1120 and 1260/1220 Infinity LC pumps	5062-2484
Wash seal PE	For 1290/1260/1220 Infinity LC pump	0905-1718
Support ring	For 1290/1260/1220 Infinity LC pump	G4220-63010
Support ring	For 1290 Infinity pump without seal wash	G4220-63015
Backup ring for seal holder	For 1290/1260/1220 Infinity LC pump	G4220-24013
Seal keeper	For 1290/1260/1220 Infinity LC pump	G4220-26210



### TIPS & TOOLS

Information on maintenance procedures can be found at [www.agilent.com/chem/LCmaintenancenotes](http://www.agilent.com/chem/LCmaintenancenotes)

## Solvent Reservoir and Supplies

### Solvent Reservoir and Supplies

Description	Part No.
<b>Solvent Reservoir</b>	
Solvent reservoir, 1 L	9301-1420
Solvent reservoir, 1 L, with cap	9301-1421
Solvent reservoir, 1 L, F29/32	9301-0656
Solvent reservoir, amber, 1 L	9301-1450
Solvent bottle, clear, 2 L, 2 inlets	5065-4421
Solvent bottle, amber, 2 L	9301-6341
Solvent bottle, clear, 2 L	9301-6342
<b>Bottle Head Assembly</b>	
Bottle head assembly for screw bottle	G1311-60003
Bottle head assembly for F29/32 tapered solvent bottle	G1312-68716
Bottle head assembly with tubing and filter For capillary and nano systems (with stainless steel solvent filter)	G1376-60003
Bottle head assembly for prep system	G1361-60022
Bottle head assembly	G4220-60007
Bottle cap with 3-hole insert	5063-6531



Solvent reservoirs



Prep bottle, 5065-4421



Solvent bottle, amber, 9301-6341



Glass filter, 5041-2168

## Cleaning the Solvent Filter

If the filter is in good condition, the solvent will freely drip out of the solvent tube (hydrostatic pressure). If the solvent filter is partially blocked, only very little solvent will drip out of the solvent tube.

Caution: Small particles can permanently block the capillaries and valves of the module.

- Always filter solvents
- Never use the module without solvent inlet filter

### Solvent Filters

Description	Recommended Use	Part No.	Frit Adapter	Part No.	Frit Inlet ID (mm)	Tube OD (mm)
Glass filter, solvent inlet, 20 µm pore size	Analytical scale, micro scale	5041-2168	Frit adapter, PTFE, 3 mm, 4/pk	5062-8517	5	3.2
Glass filter, solvent inlet, 40 µm pore size	Preparative LC	3150-0944	Frit adapter, PTFE for 4.7 mm od tubing	G1361-23205	7	4.7
Glass filter, solvent inlet, 40 µm pore size	Preparative LC	3150-0944	Frit adapter, PTFE, 4 mm	G1361-23204	7	4
Glass filter, solvent inlet, 40 µm pore size	For G2258A Dual Loop Autosampler	3150-0944	Frit adapter, PTFE for 3.2 mm od tubing	G2258-23201	7	3.2
Solvent inlet filter, stainless steel	For use in capillary and nano systems	01018-60025				



Filter frit adapters, 5062-8517

### Frits and Adapters

Description	Part No.
Solvent mixer, 1100 Series	G1312-87330
Solvent mixer, short, 200 µL	5067-1565
Frit adapter, PTFE, for 4.7 mm od tubing	G1361-23205
Frit adapter, PTFE, for 3.2 mm od tubing For G2258A Dual Loop Autosampler	G2258-23201
O-ring, Viton, 30 mm	0905-1516
Stainless steel filter assembly with PEEK ring, 2 µm pore size	5022-2192



Solvent inlet filter, 01018-60025

## Safety Caps

Open or partially covered solvent bottles can lead to the evaporation of solvents and harmful solvent vapors. Prevent solvent evaporation and possible chemical spills with solvent safety caps from Agilent. These safety caps have been designed for optimal sealing with an integrated exhaust valve providing pressurization during solvent extraction and allowing proper solvent flow to your HPLC system. The exhaust valve contains a PTFE membrane to prevent contamination of your solvents from dirt and dust particles.

- Designed to fit all solvent bottles
- Constructed of PTFE and PFA for high chemical resistance
- Caps rotate freely, preventing tube twisting during bottle exchange
- Available in GL40, GL45, S60 and NS29/32 thread sizes



10 L waste can assembly, S60, 5043-0243

### Installation Details for Solvent Safety Caps

#### Installation Guide for Standard Safety Caps – 4 Simple Steps to Install a Safety Cap

1. Guide the solvent tube through the fitting on the safety cap
2. Re-connect the solvent inlet filter to the solvent tube (open end)
3. Screw the safety cap on top of your solvent bottle
4. Adjust the length of the solvent tube in the solvent bottle and fix the tube by tightening the fitting

#### Installation Instructions for Safety Caps with Stopcocks

These caps have a shut-off valve which can be closed. This keeps the solvent tube in the bottle during maintenance activities with no risk of having solvent dropping out of the flow path.

#### 4 Simple Steps to Install a Safety Cap with Stopcocks

1. Cut the solvent tube in 2 parts
2. Connect the upper part to the fitting (red or blue) on the safety cap (Top)
3. Cut a suitable length and connect the lower part to the fitting on the safety cap (Bottom)
4. Screw the safety cap on top of your bottle



Safety Cap I, 5043-0223



Safety Cap II, 5043-0224



Safety Cap IV for GL45 bottles, 5043-0226



Safety Cap IV for S60 threaded waste bottles, 5043-0227



5 L waste can assembly, GL45, 5043-0242



10 L waste can assembly, S60, 5043-0243

**Safety Caps and Accessories**

Description	Kit Contents	Part No.
Safety Cap II with 2 ports – NS29/32	Includes 1 safety cap, 2 fittings 3.2 mm PFA, 1 venting valve with 1 µm PTFE membrane	5043-0221
Safety Cap I with 1 port – GL 45	Includes 1 safety cap, 1 fitting 3.2 mm PFA, 1 venting valve with 1 µm PTFE membrane	5043-0223
Safety Cap II with 2 ports – GL 45	Includes 1 safety cap, 2 fittings 3.2 mm PFA, 1 venting valve with 1 µm PTFE membrane	5043-0222
Safety Cap I with 1 port for prep – GL45	Includes 1 safety cap, 1 fitting 4.7 mm PFA, 1 venting valve with 1 µm PTFE membrane	5043-0300
Safety Cap I with 1 stopcock – GL45	Includes 1 safety cap, 1 fitting 2.3 mm PFA, 1 fitting 2.3 mm PTFE, 1 venting valve with 1 µm PTFE membrane	5043-0225
Safety Cap II with 2 stopcocks – GL 45	Includes 1 safety cap, 2 fittings 2.3 mm PFA, 2 fittings 2.3 mm PTFE, 1 venting valve	5043-0224
Safety Cap IV with 4 ports – 1 leak port – GL45	Includes 1 safety cap, 4 fittings 2.3 mm PFA, 4 fittings 1.6 mm PFA, 4 fittings 2.3 mm PFA, 1 leak hose. Must be used with charcoal filter, P/N 5043-0230.	5043-0226
Safety Cap IV with 4 ports – 1 leak port – S60	Includes 1 safety cap, 4 fittings 2.3 mm PFA, 4 fittings 1.6 mm PFA, 1 leak hose. Must be used with charcoal filter, P/N 5043-0230.	5043-0227
5 L waste can GL45 with 4 ports and 1 leak port	Includes 5 L waste can, 1 safety cap (5043-0226), 2 ports collector PTFE. Must be used with charcoal filter, P/N 5043-0230.	5043-0242
10 L waste can S60 with 4 ports and 1 leak port	Includes 10 L waste can, 1 safety cap (5043-0227), 2 ports collector PTFE. Must be used with charcoal filter, P/N 5043-0230.	5043-0243
Safety Waste Set S50	Includes 5 L space saving waste can, 1 safety cap, 4 fittings 2.3 mm PFA, 1 x 6.4 mm tubing connector, Charcoal filter (48 g)	5043-0831
Venting valve with 1 µm PTFE membrane*		5043-0232
Thread Adapter GL45-GL40 (PTFE)		5043-0234
Thread Adapter PTFE, GL45-GL38		5043-0272
Thread adapter GL45-GPI38-23, (PTFE)		5043-0832
Safety funnel + cover S60, PEHD, conductive		5043-0828
Safety funnel + cover S60, PEHD		5043-0829
Tool for fitting		5043-0830

\*Valve change is recommended every six months

**Replacement Parts for Safety Caps**

Description	Unit	Part No.
Fitting for 3.2 mm tube, PFA	6/pk	5043-0255
Fitting for 2.3 mm tube, PFA	5/pk	5043-0228
Fitting for 1.6 mm tube, PFA	5/pk	5043-0229
Charcoal filter, 48 g		5043-0230
Screw plug 1/4 in, PTFE		5043-0231
Venting valve with 1 µm PTFE membrane*		5043-0232
Screw plug 1/8 in, PTFE	5/pk	5043-0233
2 ports collector, PTFE		5043-0235
5 L waste can, GL45		5043-0236
10 L waste can, S60		5043-0237
3 port collector		5043-0238
Adapter for two 3.2 mm tubes		5043-0239

\*Valve change is recommended every 6 months



2.3 mm fittings to connect waste tubes from the purge valve, 5043-0228



1.6 mm fitting to connect wash tubes going to the peristaltic pump of the High Performance ALS/Wellplate Sampler, 5043-0229



Charcoal filter, 48 g, 5043-0230



Screw plug, 1/4 in, PTFE, 5043-0231



Replacement PTFE filter (replace every six months), 5043-0232



Screw plug, 1/8 in, PTFE, 5043-0233



2 ports collector (PTFE), 5043-0235



1200 Series Vacuum Degasser

## Vacuum Degassers

A vacuum degasser is recommended for:

- Maximum sensitivity in the low UV wavelength range
- High injection precision
- High retention time reproducibility
- Flow rates below 0.5 mL/min



Mounting tool, 0100-1710

## Vacuum Degasser Care

- To generally clean the vacuum degasser tubing, flush the system with isopropanol
- Flush the degasser with water after using buffers
- Speed solvent changes by drawing solvent through the degasser and tubing with syringe adapter kit



Plastic tubing cutter, 8710-1930



Ferrules and rings, 5063-6598



PPS nuts, 5063-6599

## Vacuum Degassers

Description	Comments	Part No.
Tubing kit, degasser to pump, 4/pk, 30 cm pieces of tubing with screws and bushings	For G1322A, G1379A/B	G1322-67300
Inlet tubing	For Agilent 1260 Infinity Quaternary Pump VL	5067-5378
Mounting tool for flangeless nut	For G1322A, G1379A/B	0100-1710
Plastic tubing cutter	For G1322A, G1379A/B	8710-1930
Tefzel ferrules and SS lock rings, 1/8 in, 10/pk	For G1322A, G1379A/B	5063-6598
PPS nuts, 1/8 in, 1/4-28 thread, 10/pk	For G1322A, G1379A/B	5063-6599
Union, 1/4-28 thread, polypropylene	For G1322A, G1379A/B	5022-2155
PTFE solvent tubing, 5 m, 1.5 mm id, 3 mm od	For G1322A, G1379A/B	5062-2483
Disposable syringes, 20 mL, 10/pk	For G1322A	5062-8534
Syringe adapter, 1/16 in od, 2 in long	For G1322A	9301-1337
Micro vacuum degasser tubing kit	For G1379A	G1379-67310
Micro vacuum degasser tubing kit	For G1379B	5042-8922
Online degasser accessory kit Includes 8 screws, 8 bushings, 4 markers, tubing, syringe and syringe adapter	For G1322A, G1379A/B	G1322-68705
Vacuum chamber (2 channel)	For G1379A, G1379B	5067-4798
Tubing kit for 5067-4798 vacuum chamber	For G1379A, G1379B	5067-5380
Vacuum chamber replacement kit Includes two 5067-4798 and one 5067-5380	For G1379A, G1379B	5067-5383

# Pump Kits

## Pump Kits

Description	Kit Contents	Part No.
<b>Start-up Kits</b>		
Pump start-up kit For 1100/1200/1220 RRLC pumps	Includes 1 outlet cap, 5 PTFE frits, 4 piston seals, 1 outlet gold seal, 2 glass solvent inlet filters, 20 µm, and 1 cartridge for active inlet valve	G1311-68710
Nanoflow LC start-up kit	Includes PEEK coated fused silica capillaries, column and fittings to start up a Nanoflow LC System	G2228-68700
<b>Seal Wash Kits</b>		
Active seal wash kit	Includes 2 wash seal gaskets, 2 pump seals, peristaltic pump (includes pump cassette and motor), 2 seal keepers, 2 support ring assemblies, seal insert tool and silicone tubing	G1311-68711
Active seal wash kit	Includes 4 wash seal gaskets, 4 pump seals, 2 peristaltic pumps (includes pump cassette and motor), 4 seal keepers, 4 support ring assemblies, seal insert tool and silicone tubing	G1312-68711
Continuous seal wash kit For 1100/1200/1200 RRLC pumps	Includes 2 wash seal gaskets, 4 m flex tubing, 2 pump seals, 1 flow regulator, 2 seal keepers, 2 support ring assemblies, 20 mL luer lock syringe, seal insert tool and abrasive paper	01018-68722
Seal wash kit for 1260 Capillary/Nano pump	Includes 3 adaptor luer/barbs, 2 film washers, 1 insert tool, 2 seal pumps, 1 clamp hose, 2 seal wash, 1 syringe, 2 support ring 1290 Infinity LC w/seal wash, 2 seal keepers for 1290 Infinity LC, and 2 backup rings for seal keeper 1290 Infinity	G1376-60005
Seal wash PM kit For 1260 Infinity LC pumps	Includes 2 PTFE wash seals (P/N 0905-1175), 2 gasket wash seals (P/N 01018-07102)	G1310-68742
PM kit for seal wash option	Includes 2 wash seals and 1 pack of 6 wash seal gaskets	G1310-68731
<b>Preventive Maintenance Kits</b>		
For 1260 Infinity LC isocratic or quaternary and 1220 pumps	Includes 1 PTFE pump seal (P/N 0905-1503), PTFE frits, 5/pk (P/N 01018-22707), 1 seal cap (P/N 5067-4728)	G1310-68741
For 1260 Infinity LC binary pump	Includes 1 PTFE pump seals (P/N 0905-1503), PTFE frits, 5/pk (P/N 01018-22707), 1 seal cap (P/N 5067-4728), sieves for outlet valve, 10/pk (P/N 5063-6505)	G1312-68741
For 1100/1200 isocratic or quaternary pumps	Includes piston seal, PTFE frits, and 2 seal caps	G1310-68730
For 1290 Infinity pump	Includes pump seal exchange tool, torque wrench, and hex bit	5067-4699
For Bio-inert quaternary pump	Includes bio-inert piston seal, 5/pk PTFE frits, seal cap assembly, film washer, peristaltic pump, silicone tubing, Bio-inert wash seal	G5611-68741

(Continued)



Pump start-up kit, G1311-68710

**Pump Kits**

Description	Kit Contents	Part No.
<b>Preventive Maintenance Kits</b>		
For 1100/1200 binary pump	Includes 4 piston seals, PTFE frits, 2 sieves, and 3 seal caps	G1312-68730
For G1376A capillary pump	Includes 4 pump seals, 1 stainless steel frit, and 4 seal cap assemblies	G1376-68710
For 1100/1200 and 1260 Infinity LC prep pump	Includes 1 filter cup (P/N 3150-0942), 4 seal prep flange (P/N 5022-2188), 1 filter assembly (P/N 5022-2192), 1 peristaltic pump	G1361-68710
For 1120 manual injector systems	Includes 1 piston seal, 5 PTFE frits, 1 PEEK rotor seal, and 2 seal cap assemblies	G4280-68710
For 1220 manual injector systems	Includes piston seals, PTFE frits, rotor seal, and 2 seal cap assemblies	G4280-68750
For 1220 automated injector systems	Includes piston seals, PTFE frits, rotor seal, 2 seal cap assemblies, needle and needle seat	G4280-68770
For 1120 automated injector systems	Includes 1 piston seal, 5 PTFE frits, 1 Vespel rotor seal, 1 needle, 1 needle seat, and 2 seal cap assemblies	G4280-68730
Extended PM kit For 1100/1050/1200 pumps	Includes 2 piston seals (P/N 5063-6589), PTFE frits, 5/pk (P/N 01018-22707), cartridge active inlet valve (P/N 5062-8562), outlet ball valve (P/N G1312-60067) and 2 pistons (P/N 5063-6586)	5065-4499
<b>Accessory Kits</b>		
1260 Infinity LC binary pump accessory kit	Includes 1 tubing assembly (P/N 5063-6527), 1 CAN cable (P/N 5181-1519), 1 RRLC system configurator, 1 stainless steel capillary, 400 x 0.17 mm (P/N G1312-87303), 1 stainless steel capillary, 700 x 0.17 mm (P/N G1312-87304)	G1312-68755
1100/1200 pump accessory kit	Includes 3 wrenches, 5 PTFE frits, tubing, capillary and wrist strap	G1311-68705
Pump configuration kit for G1312B with G1158B 2 position/6 port valve	Includes side cover with fixed rail, top and right cover for pump housing, and 6 connecting capillaries. Allows automatic switching between different delay volumes to optimize the system for 2.1 mm id or 4.6 mm id columns	G1312-68726
Capillary pump accessory kit	Includes purge valve and holder, hex keys 2.5 and 3 mm, 2 wrenches 1/2 in x 1/16 in, wrenches 1/4 in x 5/16 in and 14 mm, wrist strap, torque adaptor and stainless steel frit, 0.5 µm	G1376-68705
Accessory kit prep pump/gradient G1361A	Includes stainless steel connecting capillaries, solvent mixer, 2 L solvent bottle, bottle head assembly, filter, glass stop valve, stainless steel union, tubing and other parts	G1361-68707
Online degasser accessory kit	Includes 8 screws, 8 bushings, 4 markers, tubing, syringe and syringe adapter	G1322-68705
Extended flow range kit, 100 µL/min	Includes all parts to go from 20 µL/min to 100 µL/min flow rate in a capillary LC system	G1376-68707
Manual prep injection valve kit, stainless steel	Includes position sensing, 10 mL loop, 25 mL syringe, ring mounting bracket, start cable and SS connecting capillaries, 0.5 mm id, 40 cm and 60 cm	5065-9922



Outlet ball valve, G1312-60067

# Autosampler Supplies

Your Agilent autosampler is designed to deliver accurate measurements, precise injection volumes, and high-quality data. And by following a regular schedule of preventive maintenance, you can ensure a lifetime of defensible results.



## Autosampler Maintenance Schedule

Procedure	When to Perform	Time Required
Exchanging the needle assembly	When needle shows indication of damage or blockage	15 minutes
Exchanging the seat assembly	When the seat shows indication of damage or blockage	10 minutes
Exchanging the metering seal	When autosampler reproducibility indicates seal wear	30 minutes

## Injection Valves

Valve	Use With	Part No.	RheBuild Kit	Rotor Seal Material	Rotor Seal	Stator	Stator Face
2 position/6 port injection valve, 400 bar	G1313A, G1329A, G1367A/B, 1120	0101-0921	0101-1257	Vespel	0100-1853	0100-1850	0100-1851
				Tefzel	0100-1849		
				PEEK	0100-2231		
2 position/6 port micro injection valve, 400 bar	G1377A, G1389A	0101-1050		Vespel	0100-2088	0100-2089	
2 position/6 port injection valve, 600 bar	G1329B, G1367C SL, G1367D SL Plus, G1367E, 1220 Infinity LC	0101-1422		PEEK	0101-1416	0101-1417	
10 port, dual loop valve, 400 bar	G2258A	0101-1385		Vespel	0101-2415	0101-1390	
2 position/6 port MBB injection valve, 400 bar	G2260A	0101-1267	0101-1268	PEEK	0101-1268*	0100-2195	
2 position/6 port ultra high pressure valve, 1200 bar	G4226A	5067-4114		Vespel	5068-0007	5068-0006	

\*Includes seal and stator face



Injection Valve Assembly, 0101-0921



Stator for 2 position/6 port injection valve, 600 bar, 0101-1417



Stator for 2 position/6 port ultra high pressure valve, 1200 bar, 5068-0006

## Needles and Needle Seats



The needle should be replaced when it becomes bent, burred or blunt, or when it is leaking or plugged. You should suspect a leak if you notice a trail of buffer crystals on the needle seat. The needle seat can become blocked if the sample contains particulates, as this is the first restriction that the sample experiences. If this occurs, try backflushing the needle seat capillary.

### Needles and Needle Seats

Agilent Autosampler	Needle Assembly Description	Part No.	Compatible with Needle Seat	Part No.
G1313A, G1329A/B, 1120, 1220 Infinity LC (automated sampler only)	Needle assembly, standard autosampler	G1313-87201	Standard needle seat, PEEK 0.17 mm id capillary, 2.3 µL	G1329-87017
			Standard needle seat, PEEK 0.12 mm id capillary, 1.2 µL	G1329-87012
G1313A, G1329A, 1120, 1220 Infinity LC (automated sampler only)	Needle assembly, for use with PEEK seat	G1313-87203	Standard needle seat, PEEK 0.17 mm id capillary, 2.3 µL	G1313-87102
G1313A, G1329A/B, 1120, 1220 Infinity LC (automated sampler only)	Needle assembly, 900 µL upgrade	G1313-87202	Standard needle seat 0.17 mm id capillary, 2.3 µL	G1329-87017
G1389A	Needle assembly, micro LC autosampler	G1329-80001	Micro LC Needle seat 100 µm id capillary, 1.2 µL	G1329-87101
			Micro LC Needle seat 50 µm id capillary, 0.3 µL	G1329-87103
G1367A/B	Needle assembly, well plate autosampler (green)	G1367-87200	Needle seat Vespel, well plate autosampler 0.17 mm id capillary, 2.3 µL	G1367-87101
	Needle assembly, well plate autosampler (blue)	G1367-87201	Needle seat Vespel, well plate autosampler 0.12 mm id capillary, 1.2 µL	G1367-87102

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Seat Assembly 0.17 mm id standard autosampler, G1329-87017



Seat Assembly 0.12 mm id standard autosampler, G1329-87012

### Needles and Needle Seats

Agilent Autosampler	Needle Assembly Description	Part No.	Compatible with Needle Seat	Part No.
G1367C SL and G1367D SL Plus	Needle assembly, well plate autosampler (black)	G1367-87202	Needle seat, 600 bar, with seat capillary 0.17 mm id x 100 mm, 0.8 mm od	G1367-87017
			Needle seat, PEEK 600 bar, with seat capillary 0.12 mm id x 100 mm, 0.8 mm od	G1367-87012
G1367E	Needle assembly, 1290/1260 Infinity LC autosampler	G4226-87201	Needle seat, PEEK 600 bar, with seat capillary 0.12 mm id x 100 mm, 0.8 mm od	G1367-87012
G1377A	Needle assembly, micro well plate sampler	G1377-87201	Micro needle seat with seat capillary, 100 µm	G1377-87000
			Micro needle seat with seat capillary, 75 µm	G1377-87001
			Micro needle seat with seat capillary, 50 µm	G1377-87002
G2258A	Needle assembly, dual loop autosampler	G2258-68710	Twin needle seat, dual loop autosampler	G2258-87102
G2260A	Needle assembly, prep autosampler	G2260-87201	Needle seat, prep autosampler 0.5 mm id, 20 µL	G2260-87101
G4226A	Needle assembly, 1290/1260 Infinity LC autosampler	G4226-87201	Seat assembly, Vespel 0.12 mm, 1290 Infinity LC autosampler	G4226-87012
G4226A	Needle assembly, 1290/1260 Infinity LC autosampler	G4226-87201	Low dispersion needle seat	G4226-87020
G5667A	Bio-inert needle, 600 bar	G5667-87200	Bio-inert needle seat assembly, 600 bar	G5667-87017

### Accessories

Description	Use With	Part No.
Seat adapter	G1313A, G1329A, G1389A, G2260A, 1120 and 1220 Infinity LC	G1313-43204
Finger caps, for Autosampler Gripper, 15/pk	G1313A, G1329A, G1389A, G2260A, 1120 and 1220 Infinity LC	5063-6506
Tool for micro seat capillary mounting	G1377A	G1377-44900



Needle seat, PEEK 600 bar, with seat capillary, G1367-87012



Seat assembly for 1290/1260 Infinity LC, G4226-87012



Needle Assembly for 1290/1260 Infinity LC, G4226-87201

## Metering Device Supplies

Infrequently, the metering device seal and piston may need replacement if you see loss in injection volume precision or metering device leaking.

### Metering Device Supplies

Piston Description	Use With	Part No.	Seal Description	Part No.
Sapphire piston, 40 µL	G1367D, G1389A, G1377A, G4226A	5064-8293	Piston seal, 2 mm, for G1367D, G1389A, G1377A	5022-2175
			Piston seal for G4226A	0905-1717
Sapphire plunger, 100 µL	G1313A, G1329A/B, G1367A/B/C, G1367E	5063-6586	Piston seal graphite filled PTFE (reversed-phase), 2/pk	5063-6589
Sapphire plunger, 100 µL	G5667A	5067-4695	Bio-inert piston seal	G5611-21503
Sapphire piston, 900 µL	G1313A, G1329A/B, G1367E	5062-8587	Metering valve seal	0905-1294
Piston, 5 mL	G2258A	G2258-60003	Piston seal	0905-1599

### Loop Capillaries

Description	Agilent Autosampler	Part No.
Stainless steel loop capillary, 100 µL	G5667A	G5667-60320
	G1313A	01078-87302
	G1329A/B	
	1120	
	1220 Infinity LC	
	G1367A/B/C	G1367-87300
	G4226A	5067-4710
Stainless steel loop capillary, 900 µL	G1329A/B	G1313-87303
	G2260A	
Loop capillary, 40 µL	G1367D	G1377-87310
	G4226A	5067-4703
	G1367E	
	G1377A	G1377-87300
	G1389A	G1329-87302
Loop capillary, 20 µL	G4226A	G4226-60310
	G1367E	
Loop capillary, 8 µL	G1389A	G1375-87303
	G1377A	G1375-87315
Loop capillary, 5 mL	G2260A	G2260-68711



Piston seals, 5063-6589



Sample loop, 01078-87302



Loop capillary, 20 µL, G4226-60310

## Autosampler Trays

### Autosampler Trays

Description	Part No.
<b>For G1313A, G1329A/B, 1120, 1220 Infinity LC samplers</b>	
100 position tray for 2 mL vials	G1313-44510
100 position tray for 2 mL vials, thermostatable	G1329-60011
40 position tray for 2 mL vials	G1313-44512
15 position tray for 6 mL vials	G1313-44513
External vial tray for 17 vials (disposal position)	G1313-60004
Disposal tube for external vial tray	G1313-27302
<b>For G1367A/B/C/D/E, G2258A, G4226A</b>	
Well plate tray, 2 well plates, 10 vials (supports 50 mm plates)	G2258-60011
Vial plate for 54 x 2 mL vials, 6/pk	G2255-68700
Vial plate for 15 x 6 mL vials	5022-6539
<b>For G1367A/B/C/D/E</b>	
100 position tray for micro vials Also for G4226A	G4226-60021
Plate for 27 Eppendorf Safe-lock tubes, 0.5/1.5/2 mL	5022-6538
<b>For G2257A</b>	
8.5 in well plate rack, 2/pk For 16 shallow well plates, 4 deep well plates (max 48 mm height) or 6 vial racks	G2255-68709
10 in well plate rack, 2/pk For 20 shallow well plates (max height 16 mm), not compatible with deep well plates	G2255-68710
8.5 in well plate rack extension Includes 3 racks for 3 x 16 shallow well plates, 2 x 4 deep well plates (max 48 mm height) or 3 x 6 vial racks	G2255-68720
10 in well plate rack extension Includes 3 racks for 3 x 20 shallow well plates (max height 16 mm), not compatible with deep well plates	G2255-68730
<b>For G2250A</b>	
205H rack, two 96-deep well plates	G2250-04504
200 rack, 13 x 100 mm tubes (9 mL), 96	G2250-04503
207 rack, 16 x 100 mm tubes (12 mL), 75	G2250-04502
209 rack, 12 x 32 mm tubes (12 mL), 96	G2250-04501
94A special holding 1100 tray	G2250-04500



Vial plate, G2255-68700



Vial plate, 5022-6539



Plate for 27 Eppendorf Safe-lock tubes, 5022-6538

# Autosampler Kits

## Autosampler Kits

Description	Kit Contents	Part No.
<b>Preventive Maintenance Kits</b>		
For G1329B autosamplers	Includes 1 PEEK rotor seal, 1 needle seat, 1 needle	G1313-68719
For G1313A, G1329A autosamplers	Includes 1 Vespel rotor seal, 1 needle seat, 1 needle, 2 metering seals and 15 finger caps	G1313-68709
For G1313A, G1329A samplers	Includes 1 Vespel rotor seal, 1 needle seat, 1 needle	G1313-68730
For G1367A/B autosamplers	Includes 1 Vespel rotor seal, 1 needle seat, 1 needle, 1 peristaltic pump cartridge, 1 seal tight nut	G1367-68730
For G1367C/D autosamplers	Includes 1 needle assembly, 1 low carry over seat, 1 peristaltic pump, 1 rotor seal	G1367-68734
For G1367E autosampler	Includes 1 PEEK rotor seal, 1 needle seat, 1 needle, 1 peristaltic pump cartridge, 1 metering seal	G1367-68741
For 1220 manual injector systems	Includes piston seals, PTFE frits, gold seals and rotor seal	G4280-68750
For 1220 automated injector systems	Includes piston seals, PTFE frits, gold seals, rotor seal, needle and needle seat	G4280-68770
For 1120 manual injector systems	Includes 1 piston seal, 5 PTFE frits, 2 gold seals, 4 outlet caps and 1 PEEK rotor seal	G4280-68710
For 1120 automated injector systems	Includes 1 piston seal, 5 PTFE frits, 2 gold seals, 4 outlet caps, 1 Vespel rotor seal, 1 needle and 1 needle seat	G4280-68730
For G4226A HiP autosampler	Includes 1 needle seat, 1 needle, 1 rotor 2 position/6 ports, 1 peristaltic pump, 1 metering seal	G4226-68735
Extended PM kit For G1313A, G1329A autosamplers	Includes 1 Vespel rotor seal, 1 needle seat, 1 needle, 1 metering seal, 1 stator face	5065-4498

(Continued)



Maintenance kit, G1313-68709



PM kit for 1220 manual injector systems, G4280-68750

**Autosampler Kits**

Description	Kit Contents	Part No.
<b>Door Replacement Kits</b>		
Cabinet upgrade kit for 1260 Infinity LC sampler	Includes side panel, top cover and front door	G1329-68736
Cabinet kit for G1367E and G4226A	Includes side panel, base plate and top cover	5067-4662
Door replacement kit for 1260 Infinity LC sampler	Includes front and side doors	G1329-68737
Door repair kit for G1367E and G4226A	Includes front door	G4226-67001
Light protection kit for G1329A	Includes opaque front and side doors and front cover	G1329-68718
Door replacement kit for G1329A	Includes transparent front and side doors	G1329-68727
<b>Upgrade Kits</b>		
Multidraw upgrade kit for G1313A/G1327A/G1329A autosamplers	Includes 500 $\mu$ L capillary, 1500 $\mu$ L capillary and ZDV union	G1313-68711
Large volume injection kit for the Agilent 1290 Infinity autosampler G4226A	80 $\mu$ L seat capillary	G4216-68711



Cabinet upgrade kit, G1329-68736



Door replacement kit, G1329-68737



## Fraction Collector Supplies

Agilent fraction collectors are designed to process data in real-time for instantaneous and precise fraction collection, while increasing throughput on your purification system. So you can be certain that you are getting the highest degree of recovery and purity for your fractions – even with low flow rates.



### Fraction Collector Maintenance Schedule

Procedure	When to Perform
<b>Analytical and Preparative Fraction Collector Maintenance</b>	
Replace the inlet/waste tubing	Once per year – or when you notice signs of damage or wear
Replace the valve-to-needle tubing	Once per year – or when you notice signs of damage or wear
Exchange the preparative needle assembly	When the needle shows signs of damage or blockage
Exchange the analytical needle assembly	When the needle shows signs of damage or blockage, or when using the short needle assembly with tall test tubes (>45 mm)
Exchange the diverter valve	When the valve is leaking or not switching properly
Exchange the internal tray	When the flow delay sensor no longer works
Repair or exchange a funnel within the internal tray or funnel tray	When defective, leaky, blocked or contaminated
<b>Micro Fraction Collector/Spotter Maintenance</b>	
Replace fraction collector capillary	At least every six months or when worn, blocked or damaged
Exchange the capillary guiding assembly	When bent or damaged
Exchange the internal tray	When the flow delay sensor no longer works properly
Exchange the flap septum and waste tubing	At least every six months or when defective or contaminated



Micro fraction collector

**Collecting Tubes and Trays**

Tray Part No.	Hole Diameter (mm)	No. of Tubes	Tube Dimensions	Tube Part No.	Unit
G1364-84523	30	40	30 x 100 mm	5042-6458	100/pk
			30 x 48 mm	5042-6470	100/pk
G1364-84524	25	60	25 x 100 mm	5042-6459	100/pk
G1364-84525	16	126	16 x 100 mm	5022-6532	250/pk
			16 x 48 mm	5022-6533	100/pk
G1364-84516	12	215	12 x 100 mm	5022-6531	250/pk
			12 x 48 mm	5022-6534	100/pk
G1364-84532	Funnel tray	40	Any size		

**Well Plate Trays**

Tray Part No.	Description	Well Plate Part No.	Description	Unit
G1364-84521	Tray for 4 well plates, cooled	5042-1385	96-well plates, 0.5 mL, polypropylene	120/pk
		5042-1386	96-well plates, 0.5 mL, polypropylene	10/pk
G1364-84531	Tray for 4 well plates, adjustable, cooled	5042-6454	96-deep well plates, 1 mL, polypropylene	50/pk
		5042-1389	Closing mats for 96-well plates, silicone, pre-slit, fits 96-well plates P/N 5042-1385 and 5042-1386 only	50/pk
G1364-84522	Tray for 2 well plates, 10 funnels, cooled	5042-1388	384-well plates, 90 $\mu$ L, polypropylene	30/pk
		5065-4402	96-deep well collection plates with glass inserts, caps, and septa, pre-assembled, 0.35 mL	
G1367-60001	Tray for 2 well plates, 10 vials, 2 mL	5188-5321	Glass inserts, 350 $\mu$ L	1000/pk
		5188-5322	Caps/septa for glass inserts	1000/pk
		5042-8502	96-well plates, 150 $\mu$ L, conical, polypropylene	25/pk
		G2255-68700	Vial plate for 54 x 2 mL vials	6/pk
		5022-6538	Plate for 27 Eppendorf Safe-lock tubes, 0.5/1.5/2 mL	
		5022-6539	Vial plate for 15 x 6 mL vials	



Funnel tray for G1364C fraction collector, G1364-84532



Collection plate, showing 96-position closing mat, 5042-1389



Vial plate, G2255-68700



Plate for 27 Eppendorf Safe-lock tubes, 5022-6538



Vial plate, 5022-6539

**Fraction Collector Capillary Kits and Needles**

Module	Max Flow Rate	Tube Size	Tubing Kit	Needle Length	Needle	Typical Use
G1364B	100 mL/min	0.8 mm id	G1364-68711		G1364-87201	Tubes (max 100 mm)
G1364C	1 mL/min	0.15 mm id	G1364-68723	50 mm	G1367-87200	Tubes (max 48 mm), well plates, vials
	10 mL/min	0.25 mm id	G1364-68712	50 mm	G1367-87200	
	10 mL/min	0.25 mm id	G1364-68712	20 mm	G1364-87202	Funnel tray (tubes max 75 mm)
	100 mL/min	0.8 mm id	G1364-68711	20 mm	G1364-87202	
G1364D	4 µL/min	25 µm id	G1364-87304			MALDI targets, well plates
	4-30 µL/min	50 µm id	G1364-87305			
	30-100 µL/min	100 µm id	G1364-87306			

**TIPS & TOOLS**



Information on maintenance procedures can be found at [www.agilent.com/chem/LCmaintenancenotes](http://www.agilent.com/chem/LCmaintenancenotes)

**G1364D Micro Fraction Collector Supplies**

Description	Part No.
MALDI spotting adapter for G1364D	G1364-83205
Well plate adapter assembly for G1364C/D	G1364-60021
Flap septum, PEEK, for internal tray	G1364-27107
Fused silica/PEEK capillary, 25 µm, 50 cm	G1364-87304
Fused silica/PEEK capillary, 50 µm, 50 cm	G1364-87305
Fused silica/PEEK capillary, 100 µm, 50 cm	G1364-87306
Waste tube, PTFE, 20 cm, 1.4 mm id, 2.0 mm od	G1364-86711
MALDI plate carrier Bruker	5022-6541
MALDI plate carrier Bruker PAC	5022-6546
MALDI plate carrier ABI	5022-6542
MALDI plate carrier ABI Opti-TOF	5023-0238
MALDI plate carrier Agilent	5022-6543
MALDI plate carrier Micromass	5022-6544
Target plate for AP-MALDI LC/MS	G1972-60025
Calibration plate Bruker	5023-0208
Calibration plate ABI 192	5023-0209
Calibration plate ABI 10x10 & 20x20	5023-0213
Calibration plate Agilent	5023-0214
Calibration plate Micromass	5023-0215
On-line matrix kit for MALDI spotting	G1364-68706
Includes BCD board/cable, syringe, needles, adapters, connector and capillary	
Adapter, female to female 1/4-28	5042-8517
Adapter, male Luer to female 1/4-28	5042-8518
Syringe, glass, 1 mL, 1/4-28 connector	5181-1541
Micro T-connector, PEEK, swept volume 29 nL, with 1/32 in id fittings	5042-8519
MALDI spotting tips, PTFE, 10/pk	G1364-81701



MALDI spotting adapter, G1364-83205



Well plate adapter assembly, G1364-60021



MALDI plate carrier Bruker, 5022-6541



Calibration plate Bruker, 5023-0208



Union, female to female, 5042-8517



Adapter, male Luer to female, 5042-8518



Micro T-connector, PEEK, 5042-8519



Injection Valve Assembly, 0101-0921

## Valve Supplies

Agilent's industry-leading Manual Injection Valves are designed to ensure trouble-free operation with your HPLC System.

Our valves also feature patented "Make-Before-Break" architecture that allows you to switch between LOAD and INJECT positions without interrupting the flow. So you can analyze more samples in less time.

## Valve Maintenance Notes

- Vespel is a polyimide with low wear and high chemical resistance. Vespel tolerates a pH range of 0 to 10. More basic solutions dissolve Vespel, which damages the rotor seal
- PEEK offers a high chemical resistance and versatility, and will tolerate the entire pH range from 0 to 14
- Tefzel is recommended for use in applications where PEEK cannot be used, such as methylene chloride or DMSO in higher concentrations

	pH Range		
	0-7	7-10	10-14
Vespel			
PEEK			
Tefzel			

# Injection Valves

## Injection Valves

Valve	Use With	Part No.	RheBuild Kit	Rotor Seal Material	Rotor Seal	Stator	Stator Face
2 position/6 port injection valve, 400 bar	G1313A, G1329A, G1367A/B, 1120	0101-0921	0101-1257	Vespel	0100-1853	0100-1850	0100-1851
				Tefzel	0100-1849		
				PEEK	0100-2231		
2 position/6 port micro injection valve, 400 bar	G1377A, G1389A	0101-1050		Vespel	0100-2088	0100-2089	
2 position/6 port injection valve, 600 bar	G1329B, G1367C SL, G1367D SL Plus, G1367E, 1220 Infinity LC	0101-1422		PEEK	0101-1416	0101-1417	
10 port, dual loop valve, 400 bar	G2258A	0101-1385		Vespel	0101-2415	0101-1390	
2 position/6 port MBB injection valve, 400 bar	G2260A	0101-1267	0101-1268	PEEK	0101-1268*	0100-2195	
2 position/6 port ultra high pressure valve, 1200 bar	G4226A	5067-4114		Vespel	5068-0007	5068-0006	

\*Includes seal and stator face



Stator for 2 position/6 port ultra high pressure valve, 1200 bar, 5068-0006



Switching valve

## Switching Valve Supplies

A set of valve types specially designed for Agilent HPLC systems allows you to extend your HPLC applications. New valve offerings give you:

- More flexibility in solvent selection and column selection
- New automation capabilities in sample preparation
- Increased sample throughput through alternating column regeneration
- Increased separation performance with multidimensional chromatography

### External Switching Valve Replacement Parts

Description	Use With	Valve Head	Rotor Seal		Stator Face	Stator Head	Repair Kit	Bearing Ring
			Material	Rotor Seal				
2 position/6 port valve head, 600 bar	G4231A	5067-4131	PEEK	0101-1409	N/A	0101-1417	N/A	1535-4045
2 position/6 port valve head, 1200 bar	G4231B	5067-4117	Vespel	5068-0008	N/A	5068-0006		
2 position/10 port micro valve head, 600 bar	G4232A	5067-4144	PEEK	0101-1415	N/A	0101-1421		
2 position/10 port valve head, 1200 bar	G4232B	5067-4118	Vespel	5068-0012	N/A	5068-0011		
6-Column selector valve head, 600 bar	G4234A	5067-4146	PEEK	5068-0076	N/A	5068-0077		
6-Column selector valve head, 1200 bar	G4234B	5067-4142	Vespel	5068-0067	N/A	5068-0077		
Bio-inert 12 position/13 port valve POD, 210 bar	G4235A	5067-4159	PEEK	Repair Kit	Repair Kit	5068-0097	0101-1288	
Bio-inert 2 position/6 port, 600 bar	G5631A	5067-4148	PEEK	0101-1409	0100-1851	5068-0060	N/A	
2 position/10 port valve head Bio-inert, 600 bar	G5632A	5067-4132	PEEK	5068-0041	5068-0095	5068-0040		
Bio-inert 4-Column selector, 600 bar	G5639A	5067-4134	PEEK	5068-0045	5068-0093	5068-0044		

**Internal Switching Valves Replacement Parts**

Description	Use With	Part No.	Rotor Seal		Stator Face	Stator Head	Bearing Ring	Repair Kit
			Material	Rotor Seal				
2 position/6 port, 400 bar	G1316A/B	G1316-67005	Tefzel	0100-1854	0100-1851	0100-1850	0100-1852	0101-1258
			Vespel	0100-1855				
			PEEK	0100-2233				
2 position/10 port CSV, 400 bar	G1316A	G1316-67007	PEEK	Repair Kit	Repair Kit	0101-1362	0100-1852	0101-1360
2 position/6 port HP CSV, 600 bar	G1316A 1260 Series/G1316B	G1353-68750	PEEK	0101-1409	N/A	0101-1417	1535-4045	N/A
2 position/6 port micro CSV, 400 bar	G1316A	G1316-67006	Vespel	0100-2087	N/A	0100-2089		
2 position/10 port CSV, 600 bar	G1316B	G1316-67009	PEEK	0101-1415	N/A	0101-1421		
2 position/6 port valve head, 600 bar	G1316C	5067-4137	PEEK	0101-1409	N/A	0101-1417		
2 position/6 port valve head, 1200 bar	G1316C	5067-4117	Vespel	5068-0008	N/A	5068-0006		
2 position/10 port micro valve head, 600 bar	G1316C	5067-4144	PEEK	0101-1415	N/A	0101-1421		
2 position/10 port valve head, 1200 bar	G1316C	5067-4118	Vespel	5068-0012	N/A	5068-0011		
6-Column selector valve head, 600 bar	G1316C	5067-4146	PEEK	5068-0076	N/A	5068-0077		
6-Column selector valve head, 1200 bar	G1316C	5067-4142	Vespel	5068-0067	N/A	5068-0077		
8 position/9 port valve head, 400 bar	G1316C	5067-4108	PEEK	5067-4113	5067-4113	5067-4112		
8 position/9 port valve head, 600 bar	G1316C	5067-4107	PEEK	5067-4111	N/A	5068-0001		
8 position/9 port valve head, 1200 bar	G1316C	5067-4121	Vespel	5068-0002	N/A	5068-0001		
2D-LC, valve head, 1200 bar	G1316C	5067-4170	Vespel	5068-0116	N/A	5068-0115		
Bio-inert 12 position/13 port valve POD, 210 bar	G1316C	5067-4159	PEEK	0101-1288	0101-1288	5068-0097		
Bio-inert 2 position/6 port, 600 bar	G1316C	5067-4148	PEEK	0101-1409	0100-1851	5068-0060		
Bio-inert 4-Column selector, 600 bar	G1316C	5067-4134	PEEK	5068-0045	5068-0093	5068-0044		
2 position/10 port valve head Bio-inert, 600 bar	G1316C	5067-4132	PEEK	5068-0041	5068-0095	5068-0040		



Valve head, 2 position/6 port, 600 bar, 5067-4137



2 position/6 port ultra high pressure valve, 5067-4117



Valve head, 2 position/10 ports for ultra high pressure, 1200 bar, 5067-4118



Stator for 2 position/6 port ultra high pressure valve, 600 bar, 0101-1417



Rotor seal, 2 position/6 port, 600 bar for C1316B, 0101-1409

## Manual Injection Valves

Agilent provides the latest developments in LC injection technology from Rheodyne.

- Continuous flow path with "Make-Before-Break" design
- Sample capacity
- Choice of stainless or PEEK flow path
- Easy access to fittings due to wide 30° port angles



### Series 7725i and 9725i Analytical Injection Valves

Stainless steel (SS) 7725i and PEEK 9725i valves are the most popular injection valves for analytical HPLC. Features include:

- A 20  $\mu$ L loop (installed). Loops are also available in stainless steel or PEEK from 5  $\mu$ L to 5 mL (10 mL for PEEK)
- Make-Before-Break (MBB) technology allows switching without flow interruption
- Wide 30° port angles offer easier access to fittings
- Built-in position sensing switch provides the chromatograph with a reproducible start signal



7725i manual injection valve, 5063-6502

### Series 3725i-038 and 3725i Preparative Injection Valves

The series 3725i-038 (stainless steel) and 3725i (PEEK) are the most suitable manual valves for large sample volumes, high flow rates, and preparative columns sized 1.0-10 cm in diameter.

- Versatile ports accommodate 1/8 in (3.2 mm) and 1/16 in (1.6 mm) od tubing.
  - Note:** 1/16 in od tubing requires an adapter, P/N 5067-1503
- 1.0 mm diameter passages allow flow rates up to 800 mL/min with virtually no pressure drop
- Make-Before-Break technology allows switching without flow interruption
- High reproducibility for both partial-filling and complete-filling methods
- Sample range is 100  $\mu$ L to 20 mL (10 mL loop is installed)
- Flow range is 10 to 800 mL/min
- Built-in position sensing switch gives the chromatograph a reproducible start signal

## Manual Injection Valves with Position Sensing Switches

Description	Comments	Part No.	Rotor Seal Material	Rotor Seal	Stator Face	Stator Head	Bearing Ring	Isolation Seal	Repair Kit	Needle Port Adaptor
2 position/ 6 port valve, 400 bar, for G1328A/B	Analytical	5063-6502	Tefzel	0101-0620	0100-1859	0100-1860	1535-4045	1535-4046	0101-1254	N/A
			Vespel	0101-0623						
			PEEK	0101-1255						
2 position/ 6 port valve, 600 bar, for G1328C	Analytical	5067-4141	PEEK	5068-0052	N/A	5068-0053	1535-4045	1535-4046	N/A	N/A
2 position/ 6 port valve, 400 bar, for 1120	Analytical	5067-4104	PEEK	5067-4105	N/A	0100-1850	1535-5045	N/A	N/A	5067-1581
2 position/ 6 port, 600 bar, for 1220	Analytical	5067-4202	PEEK	0101-1409	N/A	0101-1417	1535-4045	N/A	N/A	5067-1581
2 position/ 6 port valve, 600 bar, for Bio-inert	Bio	5067-4158	PEEK	5068-0082	0100-1851	5068-0060	1535-4045	N/A	N/A	5067-1581
2 position/ 6 port valve, 400 bar PEEK	Analytical	0101-1253	Tefzel	0101-0620	0100-1859	1535-5082	N/A	1535-4046	N/A	N/A
Manual prep injection valve, SSt 400 bar, for 3725i	Preparative	0101-1232	PEEK	0101-1233	N/A	N/A	N/A	1535-4046	N/A	N/A
Manual prep injection valve, PEEK	Preparative	0101-1231	PEEK	0101-1233	N/A	N/A	N/A	1535-4046	N/A	N/A

## Manual Injection Valve Replacement Parts

- Rotor seals wear with use and need routine replacement
- Stators only need replacement if the ports are damaged
- PEEK rotor seals are incompatible with concentrated nitric and sulfuric acids



Stainless steel sample loops

## Manual Injection Valve Sample Loops

The right mix of injection valve sample loops are available for your application needs. Agilent offers factory-cut and finished loops of the highest quality.

- Stainless steel loops are square cut and free of burrs for a flush connection
- Flexible PEEK loops have a clean, straight cut for low dead volume connections

### Stainless Steel Sample Loops

- Sample loops for Rheodyne 7725 Series and 7125 Series valves are not interchangeable due to the change in port angle
- Actual volumes can differ due to tolerance of metal tubing bore
- Accuracy of large metal loops is  $\pm 5\%$ , intermediate loops  $\pm 10\%$ , small loops  $\pm 30\%$

### PEEK Sample Loops

- Inert to most organic solvents
- Wall thickness, temperature, exposure time and concentration of organic solvents affect the durability of PEEK tubing
- Concentrated nitric acid and sulfuric acid weaken PEEK tubing
- THF, methylene chloride and DMSO cause PEEK to swell
- Actual volumes can differ because of tolerance of tubing bore
- Accuracy of large PEEK loops is  $\pm 14\%$ , intermediate loops  $\pm 21\%$ , small loops  $\pm 65\%$

**Manual Injection Valve Sample Loops**

Volume	ID (mm)	Material	Use With	Part No.
5 $\mu$ L	0.18	SS	7125 and 7010	1535-4860
	0.18	SS	7725	0101-1248
	0.18	PEEK	9725	0101-1241
10 $\mu$ L	0.30	SS	7125 and 7010	0101-0376
	0.30	SS	7725	0100-1923
	0.25	PEEK	9725	0101-1240
20 $\mu$ L	0.51	SS	7125 and 7010	0101-0377
	0.30	SS	7725	0100-1922
	0.25	PEEK	9725	0101-1239
50 $\mu$ L	0.51	SS	7125 and 7010	0101-0378
	0.51	SS	7725	0100-1924
	0.51	PEEK	9725	0101-1238
100 $\mu$ L	0.51	SS	7125 and 7010	0101-0379
	0.51	SS	7725	0100-1921
	0.51	PEEK	9725	0101-1242
200 $\mu$ L	0.76	SS	7125 and 7010	0101-1252
	0.76	SS	7725	0101-1247
	0.51	PEEK	9725	0101-1237
500 $\mu$ L	0.76	SS	7125 and 7010	0101-1251
	0.76	SS	7725	0101-1246
	0.76	PEEK	9725	0101-1236
1 mL	0.76	SS	7125 and 7010	0101-1219
	0.76	SS	7725	0101-1245
	0.76	PEEK	9725	0101-1235
2 mL	1.00	SS	7125 and 7010	0101-1250
	1.00	SS	7725	0101-1244
	0.76	PEEK	9725	0101-1234
	1.6	PEEK	3725	0101-1229
5 mL	1.00	SS	7125 and 7010	0101-1249
	1.00	SS	7725	0101-1243
	0.76	PEEK	9725	0101-1230
	1.6	PEEK	3725	0101-1228
10 mL	2.0	PEEK	3725	0101-1227
20 mL	2.0	PEEK	3725	0101-1226



PEEK sample loops

## Syringes for Manual Injection

Agilent syringes for manual injection valves have a blunt-tip point style needle to prevent damaging the valve's internal parts. They can be used with any type/brand of manual injection valve.

### LC Manual Syringes with Fitted Plungers

Volume ( $\mu\text{L}$ )	Description	Unit	Needle	Part No.
5	Fixed		22 gauge/2 in/LC tip	5190-1480
10	Fixed		22 gauge/2 in/LC tip	5190-1484
	Removable		22 gauge/2 in/LC tip	5190-1485
	Replacement needle for 10 $\mu\text{L}$ syringe	3/pk		5190-1486
25	Fixed		22 gauge/2 in/LC tip	5190-1494
50	Fixed		22 gauge/2 in/LC tip	5190-1501
100	Fixed		22 gauge/2 in/LC tip	5190-1508
250	Fixed		22 gauge/2 in/LC tip	5190-1515
500	Fixed		22 gauge/2 in/LC tip	5190-1522



Syringe, 100  $\mu\text{L}$  FN LC tip, 5190-1508

**LC Manual Syringes with PTFE-Tipped Plungers**

Volume (µL)	Description	Unit	Needle	Part No.
10	Removable		22 gauge/2 in/LC tip	5190-1492
	Replacement needle for 10 µL syringe	3/pk		5190-1486
	Replacement plunger with PTFE tip for 10 µL syringe			5190-1558
25	Removable		22 gauge/2 in/LC tip	5190-1499
	Replacement needle	3/pk		5190-1571
	Replacement plunger with PTFE tip for 25 µL syringe			5190-1560
50	Removable		22 gauge/2 in/LC tip	5190-1505
	Replacement needle	3/pk		5190-1571
	Replacement plunger with PTFE tip for 50 µL syringe			5190-1561
100	Removable		22 gauge/2 in/LC tip	5190-1512
	Replacement needle	3/pk		5190-1571
	Replacement plunger with PTFE tip for 100 µL syringe			5190-1562
250	Removable		22 gauge/2 in/LC tip	5190-1520
	Replacement needle	3/pk		5190-1571
500	Removable		22 gauge/2 in/LC tip	5190-1526
	Replacement needle	3/pk		5190-1571
	Replacement plunger with PTFE tip for 500 µL syringe			5190-1564

**TIPS & TOOLS**

Agilent has made vial, cap and septum selection easy with its new Interactive Vial Selection Tool, available online in both desktop and mobile versions. The tool identifies the right vial and closures for your particular application, and provides the rationale for the choices offered.

Visit [www.agilent.com/chem/SelectVials](http://www.agilent.com/chem/SelectVials)



# Thermostatted Column Compartment Supplies



High temperature heat exchanger, G1316-80002



High temperature heat exchanger, G1316-80003



Heat exchanger/cooler, G1316-80004



Column Identification Module, 5062-8588

## Thermostatted Column Compartment Supplies

Description	Part No.
Capillary system for 0.12 mm id use	G1316-68744
Rapid Resolution High Throughput capillary kit Used for converting an Agilent 1200 instrument to the RRLC configuration, to enable use of high efficiency columns (to 600 bar). Can also be used for Agilent 1100 instruments.	5065-9947
1200 capillary kit for 0.12 mm id	G1316-68716
High temperature heat exchanger, 1.6 µL, 0.12 mm id, "R"	G1316-80002
High temperature heat exchanger, 1.6 µL, 0.12 mm id, "L"	G1316-80003
Heat exchanger/cooler, 1.5 µL, 0.12 mm id	G1316-80004
Carrier for heat exchanger 1290 Infinity TCC and 1200 Series TCC SL	G1316-83200
Column Identification Module (CIM), 3/pk	5062-8588
Column clamp, 6/pk	5063-6526
Column holder for micro LC columns	5001-3702
Column connecting capillary with fittings, 7 cm, 0.12 mm id, 1/16 in male/male	G1316-87303
Column connecting capillary with fittings, 9 cm, 0.17 mm id, 1/16 in male/male	G1316-87300
Column connecting capillary with fittings, 18 cm, 0.12 mm id, 1/16 in male/male	G1313-87304
Column connecting capillary with fittings, 18 cm, 0.17 mm id, 1/16 in male/male	G1313-87305
PEEK tubing, 1/32 in od, 0.4 mm id, 450 mm, Micro valve to waste	5022-6503
Thermal column insulation enclosure kit	G1316-60001

## Capillary Tubing Kits

Capillary kits are available for easy ordering and setup of the switching valves. They include all capillaries and fittings for specific applications, as well as bulk PEEK capillaries and a capillary cutter to add maximum flexibility.

### Capillary Tubing Kits

Application	Valve Kit	Part No.
Column regeneration Capillaries: 0.17 mm id	G1157A	G1156-68711
Column regeneration Capillaries: 0.25 mm id	G1157A	G1156-68713
Capillary kit column regeneration intern Capillaries: 0.17 mm id	2 position/10 port 400 bar valve, for G1316A/B	G1316-68711
Column selection Capillaries: 0.17 mm id	G1159A	G1156-68712
Sample enrichment Capillaries: 0.17 mm id	G1316A #055	G1316-68710
Sample enrichment Capillaries: 0.17 mm id	G1158A	G1156-68714
Solvent selection Flow rate up to 10 mL/min	G1160A	G1160-68706 5067-4601*

\*Use for method development applications. Kit contains longer tubing.

### Capillary Kits for Internal Switching Valves

Description	Use With	Part No.
Capillary kit column switching valve	2 position/6 port 400 bar valve, for G1316A/B	G1316-68708
Capillary kit column regeneration intern	2 position/10 port 400 bar valve, for G1316A/B	G1316-68711
Column regeneration kit for $\mu$ -LC columns	2 position/10 port CSV 600 bar, for G1316B	G1316-68721

**Capillary Kits for Column Selection Valve**

Capillary Kits Part Numbers			Valve Kit		
0.12 mm ID-A	0.17 mm ID	Other	Part No.	Valve Type	Pressure
5067-4646	5067-4730		G4231A	2 position/6 port	600
5067-4646			G4231B	2 position/6 port	1200
5067-4800	5067-5103		G4232A	2 position/10 port	600
5067-4682			G4232B	2 position/10 port	1200
5067-4729			G4234A	6 position/14 port	600
5067-4729			G4234B	6 position/14 port	1200
		5067-4601	G4235A	12 position/13 port Bio-inert	210
	5067-4767		G5631A	2 position/6 port Bio-inert	600
	5067-4769		G5639A	4 position/10 port Bio-inert	600
5067-1595				8 position/9 port	1200
	5067-1596			8 position/9 port	1200
5067-1597				8 position/9 port	1200

**Capillary Kit Contents**

Part No.	Description	Quantity
5067-1595	Heater long-up 0.12 id, 1.6 µL internal	4
	Heater long-down 0.12 id, 1.6 µL internal	4
	Carrier for heat exchanger, TCC SL Plus	4
	Flexible tubing, 280 mm, 0.12 mm id	2
	SS capillary, 340 x 0.12 mm, m/m, n-s/n-s	1
	SS capillary, 280 x 0.12 mm, ps/ps, 1 long nut, 1 short nut	8
	SS capillary, 280 x 0.12 mm, ps-ns, 2 long nuts, 1 short nut	8
	SS capillary, 280 x 0.17 mm, ps/ps, 1 long nut	1
	Flexible capillary, 0.12 x 500 mm, no fittings	1
	Fitting holder assembly	4
	Column clip set, eight colors	2
	Long fittings and ferrules, SS, 10/pk	1

(Continued)



**TIPS & TOOLS**

For internal switching valves for your TCC, see page 75

**Capillary Kit Contents**

<b>Part No.</b>	<b>Description</b>	<b>Quantity</b>
5067-1596	Capillary, 0.17 x 90 mm, 1/16 in male/male	6
	Flexible tubing, 400 mm, 0.17 mm id	1
	Flexible capillary, 0.17 x 280 mm, no fitting	2
	Plastic fitting	8
	Long fittings and ferrules, SS, 10/pk	2
	SS capillary, 280 x 0.17 mm, ps/ps, 2 long nut	1
	SS capillary, 280 x 0.17 mm, ps/ps, 1 long nut, 1 short nut	6
	SS capillary, 500 x 0.17 mm, ps-ns, 2 long nuts, 1 short nut	6
	Flexible capillary, 0.17 mm id x 600 mm	1
	Column clip set, eight colors	2
	VHP-fitting standard length (10 each = 1/pk)	6
	5067-1597	Heater long-up 0.12 id, 1.6 µL internal
Heater long-down 0.12 id, 1.6 µL internal		3
Carrier for heat exchanger, TCC SL Plus		3
Flexible tubing, 280 mm, 0.12 mm id		2
SS capillary, 340 x 0.12 mm, m/m, n-s/n-s		1
SS capillary, 280 x 0.12 mm, ps/ps, 1 long nut, 1 short nut		6
SS capillary, 400 x 0.12 mm, ps-ns, 2 long nuts, 1 short nut		6
SS capillary, 280 x 0.17 mm, ps/ps, 2 long nut		1
Flexible capillary, 0.12 x 500 mm, no fittings		1
Column clip set, eight colors		2
Fitting holder assembly		3
Long fittings and ferrules, SS, 10/pk		1
5067-4601	Bottle head assembly	4
	Tefzel ferrules/SS rings, 1/8 in, 10/pk	1
	Flexible tubing, 1 ea / 1 meter	5
	PPS nuts, 1/8 in, 1/4-28 thread, 10/pk	1
	Long fittings and ferrules, SS, 10/pk	5

(Continued)

**Capillary Kit Contents**

<b>Part No.</b>	<b>Description</b>	<b>Quantity</b>
5067-4646	SS capillary, 0.12 mm id, 340 mm pre-swaged	1
	SS capillary, 0.17 mm id, 700 mm pre-swaged	1
	SS capillary, 0.12 mm id, 90 mm pre-swaged	2
	SS capillary, 0.12 mm id, 150 mm pre-swaged	2
	SS capillary, 0.12 mm id, 280 mm pre-swaged	2
	SS capillary, 0.12 mm id, 120 mm pre-swaged	1
	SS capillary, 0.12 mm id, 200 mm pre-swaged	1
	PTFE flexible tubing	1
	Heat exchanger, long-up, 1.6 µL	1
	Heat exchanger, long-down, 1.6 µL	1
	Carrier for heat exchanger, TCC SL Plus	2
	Fitting holder assembly	1
	Column clip set, eight colors	1
	5067-4682	SS capillary, 120 x 0.12 mm, ns ns, 1 large, 1 large
SS capillary, 150 x 0.12 mm, ns ns, 1 large, 1 large		2
SS capillary, 200 x 0.12 mm, ns ps, 1 short, 1 large		1
SS capillary, 280 x 0.12 mm, ns ns, 1 large, 1 large		2
SS capillary, 340 x 0.12 mm, ps ns, 1 short, 1 large		1
SS capillary, 0.17 mm id, 700 mm pre-swaged		1
SS capillary, 90 x 0.12 mm, ns ns, 1 short, 1 large		2
Column clip set, eight colors		1
Fitting holder assembly		2
Heater long-up 0.12 id, 1.6 µL internal		1
Heater long-down 0.12 id, 1.6 µL internal		1
Carrier for heat exchanger, TCC SL Plus		2

(Continued)



**Capillary Kit Contents**

<b>Part No.</b>	<b>Description</b>	<b>Quantity</b>
5067-4729	SS capillary, 0.8 x 0.11 mm, 340 mm, RF/M4	1
	SS capillary, 0.8 x 0.11 mm, 5000 mm, RF/M4	1
	SS capillary, 0.8 x 0.11 mm, 130 mm, lg RF/M4	8
	SS capillary, 0.8 x 0.17 mm, 150 mm, lg M4/M4	1
	SS capillary, 0.8 x 0.11 mm, 250 mm, lg ps/M4	1
	Flexible PEEK tubing	2
	Heater long-up 0.12 id, 1.6 µL internal	2
	Heat exchanger, long-down, 1.6 µL	2
	Carrier for heat exchanger, TCC SL Plus	2
	Fitting holder assembly	2
	Column clip set, eight colors	1
5067-4730	SS capillary, 340 x 0.17 mm, ps-ns, 1 short, 1 long	1
	SS capillary, 0.17 mm id, 700 mm pre-swaged	1
	SS capillary, 90 x 0.17 mm, ns-ns, 1 short, 1 long	4
	SS capillary, 150 x 0.17 mm, ns-ns, 1 large, 1 large	2
	SS capillary, 280 x 0.17 mm, ns-ns, 1 large, 1 large	2
	SS capillary, 120 x 0.17 mm, ns-ns, 1 large, 1 large	1
	SS capillary, 200 x 0.17 mm, ns-ps, 1 short, 1 large	1
	PTFE flexible tubing	1
	Column clip set, eight colors	1
5067-4800	SS capillary, 340 x 0.11 mm, SW-1/16/M4	1
	SS capillary, 0.17 mm id, 700 mm, SW-1/16/M4	1
	SS capillary, 90 x 0.11 mm, SW-1/16/M4	2
	SS capillary, 0.8 x 0.11 mm, 150 mm, large RF/M4	2
	SS capillary, 0.8 x 0.11 mm, 280 mm, large RF/M4	1
	SS capillary, 0.8 x 0.17 mm, 150 mm, large M4/M4	1
	SS capillary, 0.8 x 0.12 mm, 250 mm, large ps/M4	1
	PEEK tubing, 1/32 in od, 0.4 mm id, 450 mm	2
	Heat exchanger, long-down, 1.6 µL	1
	Heater long-up 0.12 id, 1.6 µL internal	1
	Carrier for heat exchanger, TCC SL Plus	2
	Fitting holder assembly	2
	Column clip set, eight colors	1

(Continued)

**Capillary Kit Contents**

<b>Part No.</b>	<b>Description</b>	<b>Quantity</b>
5067-4767	Capillary, 400 x 0.17 mm Bio	1
	Capillary, 300 x 0.17 mm Bio	2
	Fitting holder assembly	2
	Column clip set, eight colors	1
	Finger-tight fittings, long, 1/16 in, 10/pk	1
5067-4769	Capillary, 400 x 0.17 mm Bio	1
	Capillary, 300 x 0.17 mm Bio	4
	Fitting holder assembly	2
	Column clip set, eight colors	1
	Finger-tight fittings, long, 1/16 in, 10/pk	1
5067-5103	SS capillary, 340 x 0.17 mm, ps-ns SW-M4	1
	SS capillary, 0.17 mm id, 700 mm, SW-1/16/M4	1
	SS capillary, 90 x 0.17 mm, SW-1/16/M4	2
	SS capillary, 90 x 0.17 mm, RF/M4	2
	SS capillary, 0.8 x 0.17 mm, 150 mm, lg RF/M4	2
	SS capillary, 0.8 x 0.17 mm, 280 mm, lg RF/M4	2
	SS capillary, 0.8 x 0.17 mm, 150 mm, large M4/M4	1
	SS capillary, 0.8 x 0.12 mm, 250 mm, large ps/M4	1
	PEEK tubing, 1/32 in od, 0.4 mm id, 450 mm	1
	Column clip set, eight colors	1



## Detector Supplies

Agilent wavelength detectors combine exceptional flexibility with superior instrument control, data communication, and analytical capabilities. This section shows you how to maintain your detector's high level of selectivity and sensitivity.



### Detector Maintenance Tips

Symptom	What To Do	Additional Information
Lamp does not ignite	Exchange the lamp	Perform a wavelength calibration test and an intensity test after lamp replacement
Noise exceeds application limit	Exchange the flow cell	Perform a wavelength calibration test after flow cell replacement
Drift exceeds application limit	Exchange the lamp	Perform a wavelength calibration test and a pressure tightness test after flow cell replacement
Leaky flow cell (For G4212 only)	Exchange the flow cell	Perform a wavelength calibration test after flow cell replacement
Leaky flow cell (For all G1314/G1315/G1365 detectors)	Clean or exchange the flow cell	Perform a wavelength calibration test and a pressure tightness test after flow cell replacement
Lower intensity (For G4212 only)	Exchange the flow cell	Perform a wavelength calibration test after flow cell replacement
Lower intensity (For all G1314/G1315/G1365 detectors)	Clean or exchange the flow cell	Perform a wavelength calibration test and a pressure tightness test after flow cell replacement



Deuterium lamp, G1314-60100



Long life HiS Deuterium lamp, 5190-0917



Deuterium longlife lamp, 2140-0813



Long life Deuterium lamp, 5182-1530



Deuterium lamp, 2140-0590



Tungsten lamp assembly, G1103-60001

## Certified Lamps

- All lamps are tested for noise and drift specifications, correct operating voltage, light intensity and proper alignment
- Improved coating process increases Agilent lamp lifetimes up to 50%
- Agilent deuterium lamps are designed with a much narrower aperture providing increased light intensity and decreased noise – translating into an appreciably higher signal-to-noise ratio
- By providing higher sensitivity, Agilent lamps can extend detection capabilities and improve qualification at trace levels – for more than 2,000 hours of use

Agilent's lamps are manufactured in an ISO 9001 certified environment and are fully traceable throughout every step of the production process. Each lamp is then tested to ensure it meets Agilent's performance specifications. Test equipment is regularly calibrated using optical standards certified by NIST (National Institute of Standards and Technology) or PTB (Physikalisch-Technische Bundesanstalt).

### Detector Lamps

Description	Comments	Part No.
<b>Variable Wavelength Detector (VWD)</b>		
Long life Deuterium lamp with RFID tag	For G1314D/E/F	G1314-60101
Long life Deuterium lamp	For G1314A/B/C, 1120 and 1220 Infinity LC	G1314-60100
<b>Diode Array Detector (DAD)/Multiple Wavelength Detector (MWD)</b>		
Long life HiS Deuterium lamp (8-pin) with RFID tag	For G4212A/B	5190-0917
Long life Deuterium lamp with RFID tag	For G1315C/D and G1365C/D	2140-0820
Long life Deuterium lamp	For G1315A/B and G1365A/B	2140-0813
Long life Deuterium lamp	For G1315A/B and G1365A/B	5182-1530
Deuterium lamp	For G1315A/B and G1365A/B	2140-0590*
Tungsten lamp	For G1315A/B/C/D and G1365A/B/C/D	G1103-60001

\*Standard lamp for 1000 hours of use only

## Variable Wavelength Detector (VWD)

### VWD Flow Cell Selection

Typical Column Length (cm)	Typical Peak Width	Recommended Flow Cell				
< = 5	0.025	Micro Flow Cell			High Pressure Flow Cell For Pressure Above 100 bar	
10	0.05	0.05-0.2 mL/min	Semi-micro Flow Cell			
20	0.1				Standard Flow Cell	
> = 40	0.2					
Typical Flow Rate		0.05-0.2 mL/min	0.2-0.4 mL/min	0.4-0.8 mL/min	1-2 mL/min	0.05-5 mL/min
Internal Column Diameter		1.0 mm	2.1 mm	3.0 mm	4.6 mm	

### Flow Cell and Repair Kits for VWD\*

Description	Use With	Specifications	Part No.	Repair Kit Part No.
Standard flow cell, RFID	G1314D/E/F	10 mm, 14 $\mu$ L, 40 bar	G1314-60186	G1314-65061
Standard "D" type flow cell	G1314A/B/C	10 mm, 14 $\mu$ L, 40 bar	G1314-60086	G1314-65061
Semi-micro flow cell, RFID	G1314D/E/F	6 mm, 5 $\mu$ L, 40 bar	G1314-60183	G1315-68713
Semi-micro flow cell	G1314A/B/C	6 mm, 5 $\mu$ L, 40 bar	G1314-60083	G1315-68713
Micro flow cell, 3 mm, RFID	G1314D/E/F	2 $\mu$ L, 120 bar	G1314-60187	G1315-68713
Micro flow cell, 3 mm	G1314A/B/C	2 $\mu$ L, 120 bar	G1314-60087	G1315-68713
Micro flow cell, 5 mm	G1314A/B/C	1 $\mu$ L, 40 bar	G1314-60081	G1314-65052
High pressure flow cell, RFID	G1314D/E/F	10 mm, 14 $\mu$ L, 400 bar	G1314-60182	G1314-65054
High pressure flow cell	G1314A/B/C	10 mm, 14 $\mu$ L, 400 bar	G1314-60082	G1315-68713

\*For more information about what is included in each kit, see page 97.



Variable wavelength detector

**Capillaries for VWD Flow Cell**

<b>Flow Cell Description</b>	<b>Part No.</b>	<b>Inlet Capillary</b>	<b>Part No.</b>	<b>Outlet Capillary</b>	<b>Part No.</b>
Standard flow cell, RFID	G1314-60186	Inlet capillary, 0.17 mm id, 600 mm long	5062-8522	Waste capillary, PEEK, 0.25 mm id	5062-8535
Standard "D" type flow cell	G1314-60086			1/16 in finger-tight PEEK fitting, 2/pk	0100-1516
Semi-micro flow cell, RFID	G1314-60183	Inlet capillary, 0.12 mm id, 400 mm long	5021-1823	Waste capillary, PEEK, 0.25 mm id	5062-8535
Semi-micro flow cell	G1314-60083			1/16 in finger-tight PEEK fitting, 2/pk	0100-1516
Micro flow cell, 3 mm, RFID	G1314-60187	Inlet capillary, 0.12 mm id, 310 mm long	G1314-87301	Outlet capillary, 0.17 mm id, 120 mm long	G1314-87302
Micro flow cell, 3 mm	G1314-60087				
Micro flow cell, 5 mm	G1314-60081	Inlet capillary, 0.12 mm id, 400 mm long	5021-1823	Outlet capillary, 0.17 mm id, 120 mm long	G1314-87302
High pressure flow cell, RFID	G1314-60182	Inlet capillary, 0.17 mm id, 380 mm long	G1315-87311	Outlet capillary, 0.17 mm id, 120 mm long	G1314-87302
High pressure flow cell	G1314-60082				



## Diode Array Detector (DAD)/Multiple Wavelength Detector (MWD)



Diode array detector (DAD)/  
Multiple wavelength detector (MWD)

### Cleaning or Replacing DAD/MWD Flow Cells

- A decrease in detector performance or unusual noise levels may mean you have dirty flow cell windows
- Clean and reassemble one side of the flow cell before beginning the other side to prevent mixing the front and rear gaskets, which have different hole diameters
- While cleaning or replacing flow cell windows, if the washers fall out of the window assembly, they must be inserted in the correct order with a PTFE ring to prevent any leaks from the flow cell window
- Clean the cell body with water or isopropanol
- After opening the cell you should always use a new gasket

#### DAD/MWD Flow Cell Selection

Typical Column Length (cm)	Typical Peak Width	Recommended Flow Cell				
< = 5	0.025	80/500 nL Flow Cell				High Pressure Flow Cell
10	0.05		Semimicro Flow Cell			
20	0.1			Standard Flow Cell		
> = 40	0.2					
Typical Flow Rate		0.05-0.2 mL/min	0.2-0.4 mL/min	0.4-0.8 mL/min	1-2 mL/min	0.05-5 mL/min
Internal Column Diameter		0.3-1 mm	2.1 mm	3.0 mm	4.6 mm	

**Flow Cell and Repair Kits for DAD/MWD\***

Description	Use With	Specifications	Part No.	Repair Kit Part No.
Standard flow cell with RFID tag	G1315C/D, G1365C/D	10 mm, 13 $\mu$ L, 120 bar	G1315-60022	G1315-68712
Standard flow cell	G1315A/B, G1365A/B	10 mm, 13 $\mu$ L, 120 bar	G1315-60012	
Semi-micro flow cell, RFID	G1315C/D, G1365C/D	6 mm, 5 $\mu$ L, 120 bar	G1315-60025	G1315-68713
Semi-micro flow cell	G1315A/B, G1365A/B	6 mm, 5 $\mu$ L, 120 bar	G1315-60011	
Micro flow cell, RFID	G1315C/D, G1365C/D	3 mm, 2 $\mu$ L, 120 bar	G1315-60024	G1315-68713
Micro high-pressure flow cell	G1315A/B, G1365A/B	6 mm, 1.7 $\mu$ L, 400 bar	G1315-60015	
500 nL flow cell		10 mm, 50 bar	G1315-68724	
80 nL flow cell		6 mm, 50 bar	G1315-68716	
Preparative flow cell	G1315A/B, G1365A/B	3 mm, 120 bar, stainless steel	G1315-60016	G1315-68712
Preparative flow cell		0.3 mm, 20 bar, quartz	G1315-60017	
Preparative flow cell		0.06 mm, 20 bar, quartz	G1315-60018	
Max-Light cartridge cell	G4212A/B Infinity LC DAD	10 mm, 1.0 $\mu$ L, 60 bar	G4212-60008	
Max-Light cartridge cell	G4212A/B Infinity LC DAD	60 mm, 4.0 $\mu$ L, 60 bar	G4212-60007	
Max-Light cartridge test cell	Must be used to perform detector build-in tests		G4212-60011	
Max-Light ultra low dispersion flow cell	G4212A/B Infinity LC DAD	10 mm $V(\sigma) = 0.6 \mu$ L	G4212-60038	
Max-Light High Dynamic Range (HDR) flow cell	G4212A/B Infinity LC DAD	3.7 mm, $V(\sigma) = 0.9 \mu$ L	G4212-60032	

\*For more information about what is included in this kit, see page 97.



Max-Light cartridge cell, G4212-60008



Ultra-low dispersion flow cell, G4212-60038

**TIPS & TOOLS**



Learn more about how different flow cells impact your chromatography, and the High Dynamic Range (HDR) Flow Cell. See application note 5991-0115EN at [www.agilent.com/chem/library](http://www.agilent.com/chem/library)



Max-Light cartridge cell, interior view, 60 mm path for high concentrations, G4212-60007



Max-Light HDR flow cell, interior view, to show short 3.7 mm path length for high concentrations, G4212-60032

### Capillaries for DAD/MWD Flow Cell

Flow Cell Description	Part No.	Inlet Capillary	Part No.	Outlet Capillary	Part No.
Standard flow cell with RFID tag	G1315-60022	Inlet capillary with heat exchanger, 0.17 mm id, 590 mm long	G1315-87321	Outlet capillary, 0.17 mm id, 200 mm long	G1315-87302
Standard flow cell	G1315-60012				
Semi-micro flow cell with RFID tag	G1315-60025	DAD heat exchanger capillary, 0.17 mm id, 310 mm long	G1315-87319	Outlet capillary, 0.12 mm id, 200 mm long	G1315-87306
				Outlet capillary, 0.17 mm id, 200 mm long	G1315-87302
Semi-micro flow cell	G1315-60011			Outlet capillary, 0.12 mm id, 200 mm long	G1315-87306
				Outlet capillary, 0.17 mm id, 200 mm long	G1315-87302
Micro flow cell with RFID tag	G1315-60024	DAD heat exchanger capillary, 0.12 mm id, 310 mm long	G1315-87339	Outlet capillary, 0.12 mm id, 200 mm long	G1315-87306
				Outlet capillary, 0.17 mm id, 200 mm long	G1315-87302
Micro high-pressure flow cell	G1315-60015	Inlet capillary with heat exchanger, 0.12 mm id, 290 mm long	G1315-87325	Outlet capillary, 0.12 mm id, 200 mm long	G1315-87306

### 80 nL and 500 nL Flow Cell Supplies

Description	Unit	Part No.
Fitting screw	10/pk	5063-6593
Double winged nuts and 1/32 in ferrules	10/pk	5065-4422
1/32 in ferrule and stainless steel lock ring, lite touch	10/pk	5063-6592
Union adjustment tool	2/pk	5022-2146
Universal ZDV union, stainless steel, no fittings	2/pk	5022-2184
Torque wrench adapter		G1315-45003
Open end wrench, 4 mm		8710-1534



Stainless steel fittings, male (G), 5063-6593



Double winged PEEK nut & ferrule (WPF), 5065-4422



ZDV universal union, 5022-2184



Wrench, open end, for use with PEEK-coated fused silica capillaries, 8710-1534

### 500 nL Flow Cell and Replacement Parts

Description	Comments	Part No.
500 nL flow cell	Contains quartz flow cell with 10 mm path length and 500 nL volume and connecting capillaries, max 50 bar pressure	G1315-68724
Sealing kit	Includes torque adapter, 2 cell seal assemblies, 5 LiteTouch front and back ferrules	G1315-68715
Quartz cell body, 10 mm		G1315-80001
Cell seal assembly, 500 nL		G1315-87101
Fused silica/PEEK capillary, 100 µm id, 30 cm long	Inlet	G1315-87333
Fused silica/PEEK capillary, 50 µm id, 40 cm long	Inlet	G1315-87323
Fused silica/PEEK capillary, 100 µm id, 12 cm long	Outlet	G1315-87338
Fused silica/PEEK capillary, 50 µm id, 12 cm long	Outlet	G1315-87328

### 80 nL Flow Cell and Replacement Parts

Description	Comments	Part No.
80 nL flow cell	Contains quartz flow cell with 6 mm path length and 80 nL volume and connecting capillaries, max 50 bar pressure	G1315-68716
Sealing kit for 80 nL flow cell	Includes torque adapter, 2 cell seal assemblies, 5 LiteTouch front and back ferrules and 5 sleeves for 360 µm od capillaries	G1315-68725
Quartz cell body, 80 nL, 6 mm path length		G1315-80002
Fused silica/PEEK capillary, 50 µm id, 40 cm long	Inlet	G1315-87323
Fused silica/PEEK capillary, 50 µm id, 12 cm long	Outlet	G1315-87328
Fused silica/PEEK capillary, 25 µm id, 20 cm long	Inlet	G1315-87313
Fused silica/PEEK capillary, 25 µm id, 60 cm long	Outlet	G1315-87318

### Preparative Flow Cells and Replacement Parts

Description	Part No.
Preparative flow cell, 0.3 mm, 20 bar, quartz	G1315-60017
Preparative flow cell, 0.06 mm, 20 bar, quartz	G1315-60018
PTFE tubing, 0.8 mm id, 2 m	G1315-67301
PTFE tubing, 0.5 mm id, 0.8 m	G1315-67302
Cell housing	G1315-27705
1/16 in finger-tight PEEK fitting, 2/pk	0100-1516
Quartz body, 0.3 mm	G1315-80004
Quartz body, 0.06 mm	G1315-80003
Prep flow cell, stainless steel, 3 mm, 120 bar	G1315-60016
Stainless steel connecting capillary, 0.5 mm, 250 mm	G1315-87305



Finger-tight PEEK fitting (SPF), 0100-1516

## Detector Maintenance Kits

### Detector Maintenance Kits

Description	Kit Contents	Part No.
<b>Variable Wavelength Detector (VWD)</b>		
Standard "D" type flow cell kit	Includes 2 windows, 2 gaskets #1, 2 gaskets #2	G1314-65061
Semi-micro flow cell kit	Includes 2 windows, 4 gaskets: 2 standard #1, 1 semi-micro #1, 1 semi-micro #2	G1314-65056
Micro flow cell kit	Includes 2 windows, 2 gaskets #1, 2 gaskets #2	G1314-65052
Cell repair kit, semi-micro	Includes window screw kit, 4 mm hexagonal wrench and seal kits	G1315-68713
High-pressure flow cell kit	Includes 2 windows, 2 Kapton gaskets and 2 PEEK rings	G1314-65054
<b>Diode Array Detector (DAD)/Multiple Wavelength Detector (MWD)</b>		
Cell repair kit	Includes window screw kit, 4 mm hexagonal wrench and seal kit	G1315-68712
Cell repair kit, semi-micro	Includes window screw kit, 4 mm hexagonal wrench and seal kits	G1315-68713
Sealing kit for 500 nL flow cell	Includes torque adapter, 2 cell seal assemblies, 5 lite touch front and back ferrules	G1315-68715
Sealing kit for 80 nL flow cell	Includes torque adapter, 2 cell seal assemblies, 5 lite touch front and back ferrules and 5 sleeves for 360 µm od capillaries	G1315-68725



1200 Series Evaporative Light Scattering Detector



Standard flow nebulizer, G4218-20000



Cartridge for gas regulator, G4218-40150

## Other Detectors

### G4218A 1200 Series Evaporative Light Scattering Detector Supplies

Description	Part No.
Standard flow nebulizer	G4218-20000
Semi-micro flow nebulizer	G4218-20001
Large flow nebulizer	G4218-20002
Micro flow nebulizer	G4218-20003
RRLC nebulizer	G4218-20004
Nebulization chamber, glass	G4218-40000
Black plastic nut, 13 mm diameter, glassware	G4218-40010
Black plastic nut, 22 mm diameter, glassware	G4218-40011
Black exhaust tube, 2.5 m	G4218-40110
Bulkhead	G4218-40130
Cartridge, 0.01 µm for gas regulator	G4218-40150
Pneumatic tube with stainless steel fitting	G4218-40220
Drain tube with stainless steel fitting	G4218-40100
Gas regulator with 0.01 µm filter and manometer	G4218-60100
Seal kit for nebulization chamber	G4218-68010
Caffeine standard, 250 µg/mL	G4218-85000

### G1362A 1100/1200 Series Refractive Index Detector (RID) Supplies

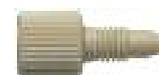
Description	Part No.
Tubing kit	G1362-68709
Includes 300 mm recycle valve to recycle port, 200 mm recycle valve to waste port, 120 mm purge valve to recycle valve, 270 mm purge valve to sample cell, 170 mm purge valve to reference cell	
Interface tubing kit	G1362-68706
Includes 1/8 in ferrule, 1/3 in nut, PTFE tubing	
Interface capillary, 400 mm, 0.17 mm id	G1362-87300
Restriction capillary, 0.17 mm id	G1362-87301

**G1321A/B 1100/1200 Series Fluorescence Detector (FLD) Supplies**

Description	Part No.
Detector lamp	2140-0600
Flow cell, 8 $\mu$ L, 20 bar	G1321-60005
Flow cell, 4 $\mu$ L	G1321-60015
Cuvette kit, 8 $\mu$ L, 20 bar	G1321-60007
Includes tubing, stainless steel fitting, front and back ferrule, PEEK fitting, syringe needle and syringe	
Cut-off filter kit:	
389, 408, 450, 500, 550 nm	5061-3327
380, 399, 418, 470, 520 nm	5061-3328
280, 295, 305, 335, 345 nm	5061-3329
Corrugated tubing, polypropylene, 6.5 mm id, 5 m	5062-2463
PTFE tubing, FEP, 0.7 mm id, 5 m	5062-2462
1/16 in finger-tight PEEK fitting, 2/pk	0100-1516
Column connecting capillary with fittings, 380 x 0.17 mm	G1315-87311
1/16 in stainless steel front ferrule, 10/pk	5180-4108
1/16 in stainless steel back ferrule, 10/pk	5180-4114
1/16 in stainless steel fitting, 10/pk	5061-3303
Fluorescence detector calibration sample, 1 g glycogen	5063-6597
Open end wrench, 1/4 and 5/16 in	8710-0510
Glass syringe	9301-1446
Syringe needle	9301-0407



Flow cell for G1321A fluorescence detector, G1321-60005



Finger-tight PEEK fitting (SPF), 0100-1516



Stainless steel front ferrules, 5180-4108



Back ferrules 1/16 in, 5180-4114

## 1100/1200 Series Chip LC Supplies

### 1100/1200 Series Chip LC Supplies

Description	Part No.
Rotor, inner valve, 3 grooves, chip LC	G4240-23705
Rotor, outer valve, 5 grooves, chip LC	G4240-25206
PEEK fitting, special for chip LC	G4240-43200
Fused silica/PEEK capillary, 15 $\mu$ m, 90 cm	G4240-87300
Nano pump to chip cube	
Fused silica/PEEK capillary, 25 $\mu$ m, 105 cm	G4240-87301
Micro well plate sampler to chip cube	
Fused silica/PEEK capillary, 100 $\mu$ m, 100 cm	G4240-87302
Chip cube to waste	
Fused silica/PEEK capillary, 75 $\mu$ m, 100 cm	G4240-87303
Syringe pump to chip cube	
Fused Silica/PEEK capillary, 50 $\mu$ m, 50 cm	G4240-87304
Inline micro filter kit, 0.5 $\mu$ m, PEEK	5067-1582
Use with chip cube LC system	
Fitting with 0.5 $\mu$ m PEEK frit, 10/pk	5067-1584
PEEK fitting for use with 1/32 in od, 10/pk	5067-1585
PEEK sample transfer capillary, 25 $\mu$ m, 100 cm	G4240-87309
Micro inline filter to chip cube (Phospho-Chip application)	
PEEK capillary, 25 $\mu$ m, 10 cm	G4240-87310
Micro well plate sampler to micro inline filter (Phospho-Chip application)	

## Bio-inert Supplies

### Agilent 1260 Infinity Bio-inert Quaternary LC Supplies

For your challenging bio-molecule analyses, the new 1260 Infinity Bio-inert Quaternary LC System sets new standards in performance, reliability, and robustness. Analysis of proteins and biotherapeutics usually presents the most challenging solvent conditions for any LC instrument. In addition, bio-molecules tend to bind unspecifically to surfaces, requiring tedious procedures. To address these needs, Agilent designed this application-specific LC instrument for bio-molecular analysis – without any compromise in performance – built on the proven Agilent 1200 Infinity platform technology.

The Agilent 1260 Infinity Bio-inert Quaternary LC features bio-inertness for all components without exception. The sample flow path through autosampler, capillaries and a variety of detectors are completely metal-free, with only PEEK and ceramic components coming into contact with your bio-molecule. Thus, the uncertainty of secondary interaction for proteins and peptides with surfaces which can result in peak tailing, low recovery and decreased column lifetime is minimized – and your confidence maximized.

#### 1260 Bio-inert Quaternary Pump Parts

Description	Part No.
Bio-inert purge valve	G5611-60061
Bio-inert active inlet valve	G5611-60025
Bio-inert cartridge for active inlet valve, 600 bar	G5611-60020
Bio-inert outlet ball valve	G5611-60067
Sapphire plunger	5067-4695
Bio-inert piston seal	G5611-21503
Bio-inert wash seal	0905-1731
Bio-inert seal keeper	G5611-26210
Bio-inert support ring	G5611-63010
Preventative maintenance kit for Bio-inert quaternary pump	G5611-68741

#### 1260 Bio-inert High Performance Autosampler Parts

Description	Part No.
2 position/6 port valve head, 600 bar	5067-4131
Rotor seal, 3 grooves, max 600 bar	0101-1416
Bio-inert stator	5068-0060
Stator face, ceramic	0100-1851
Bio-inert needle, 600 bar	G5667-87200

(Continued)



#### TIPS & TOOLS

For information on the family of complementary Biocolumns, turn to page 350.



Stator face, ceramic, 0100-1851

### 1260 Bio-inert High Performance Autosampler Parts

Description	Part No.
Tool for needle adjustment	G5667-40500
Bio-inert needle seat assembly, 600 bar	G5667-87017
Sapphire plunger	5067-4695
Bio-inert piston seal	G5611-21503
Sample loop, 100 µL, Bio-inert	G5667-60320

### 1260 Bio-inert Valve Parts



Rotor seal, 2 position/6 port, 600 bar for G1316B, 0101-1409

Description	Use With	Part No.
Rotor seal, 3 grooves, max 600 bar	Bio-inert 2 position/6 port switching valve	0101-1409
Bio-inert stator	Bio-inert 2 position/6 port switching valve	5068-0060
Stator face, ceramic	Bio-inert 2 position/6 port switching valve	0100-1851
Bio-inert rotor, 2-position/10-port, 600 bar		5068-0041
Bio-inert stator, 2-position/10-port, 600 bar		5068-0040
Bio-inert rotor seal, 4 column PEEK	Bio-inert 4 column selection valve	5068-0045
Bio-inert PEEK tube from valve to needle		G5664-86703
Bio-inert PEEK tube valve to detector		G5664-86706
Bio inert 12 position/13 port, solvent selection valve	G4235A	5067-4159

### 1260 Bio-inert Detector Parts



Bio-inert union, 600 bar, 5067-4741

Description	Use With	Part No.
Bio-inert standard flow cell, with RFID tag	G1315C/D and G1365C/D	G5615-60022
Bio-inert max light cartridge cell	G4212A/B	G5615-60017
Bio-inert max light cartridge cell	G4212A/B	G5615-60018
Bio-inert FLD flow cell	G1321B	G5615-60005
PEEK tubing		0890-1763

### 1260 Bio-inert Fittings

Description	Part No.
Bio-inert union, stainless steel with PEEK insert 600 bar	5067-4741

### 1260 Bio-inert Column Compartment



Bio-inert low dispersion heat exchanger, G5616-60050

Description	Part No.
Bio-inert low dispersion heat exchanger	G5616-60050

## LC/MS Supplies

Combined with Agilent's industry-leading LC systems, our single quadrupole, ion trap, triple quadrupole, TOF and Q-TOF LC/MS solutions combine world-class performance with legendary reliability and ease-of-use.

This section contains all of the mass spectrometry supplies you need to keep your LC mass spectrometer running at peak performance.



### LC/MS Maintenance Schedule

Procedure	When to Perform
Flush the nebulizer	Daily or at the end of each shift to flush traces of samples and buffers out of the tubing, valves, and nebulizer.
Clean the electrospray spray chamber	Daily or anytime you suspect carryover contamination from one sample or analysis to another.
Replace the electrospray nebulizer needle	When the needle is plugged. Common symptoms of a plugged needle are increased LC backpressure, off-axis spraying, or dripping from the nebulizer.
Clean the APCI spray chamber	Daily or anytime you suspect carryover contamination from one sample or analysis to another.
Replace the APCI nebulizer needle	When the needle is plugged. Common symptoms of a plugged needle are increased LC backpressure or off-axis spray from the nebulizer.
Clean the multimode source	Daily or anytime you suspect carryover contamination from one sample or analysis to another, or when you must access the end cap and capillary cap for cleaning and inspection.
Check calibrant levels	Monthly or weekly if you tune the LC/MS frequently.





Agilent 6100 Series  
Single Quadrupole LC/MS, G6140A

## LC/MS Preventive Maintenance Kit

For your convenience, the LC/MS Preventive Maintenance Kit has the recommended common supplies needed for most Agilent LC/MS systems. Unique source parts should be ordered separately.

### LC/MS Preventive Maintenance kit

Description	Part No.
LC/MS Preventive Maintenance kit	5190-1443
Foreline pump (rotary pump) oil, Inland 45, 1 L, for E1M18/E2M28	6040-0834
Oil mist filter element for E2M18	1535-4970
Filter element, 5 µm, 5/pk	0100-2051
Spring, canted coil, 4/pk	1460-2571
Big hydrocarbon trap, 1/4 in fittings	BHT-4
Rotor seal, Vespel, pH 0 to 10	0100-1855



Foreline pump oil, 6040-0834



Oil mist filter element for E2M18, 1535-4970



### TIPS & TOOLS

Save ordering time and money with the LC/MS PM Kit! It contains the common supplies specified in Agilent service engineer preventive maintenance procedure for LC/MS platforms.

## LC/MS Supplies

Description	6100 Series	6200 Series	6300 Series	6400 Series	6500 Series	Part No.
	Single Quadrupole LC/MS			TOF LC/MS		
ES nebulizer assembly, original	✓	✓	✓	✓	✓	G1946-60098
ES nebulizer needle (original) replacement kit	✓	✓	✓	✓	✓	G2427A
ES nebulizer assembly, new	✓	✓	✓	✓	✓	G1958-60098
ES nebulizer needle (new) replacement kit	✓	✓	✓	✓	✓	G1958-60136
APCI nebulizer assembly	✓	✓	✓	✓	✓	G1946-60037
APCI nebulizer needle replacement kit	✓	✓	✓	✓	✓	G2428A
Needle assembly APCI/Multimode	✓	✓	✓		✓	G1947-60103
Corona needle APCI/Multimode	✓	✓	✓	✓	✓	G1947-20029
Capillary cap, high temperature, 3.0 mm	✓	✓	✓	✓	✓	G1946-20301
Capillary, 0.5 mm id, dielectric*	✓		✓			G1946-80009
Capillary, 0.6 mm id, dielectric*	✓	✓	✓	✓	✓	59987-20040
Capillary, 0.6 mm id, resistive, fast polarity switching*				✓		G1960-80060
Spring, canted coil, 0.25 in id, 0.53 mm	✓	✓	✓	✓	✓	1460-2571
1/6 in tee, low dead volume, stainless steel		✓			✓	0100-0969

\*Dielectric capillary supports standard polarity switching only. Resistive capillary supports fast polarity switching.

(Continued)



Corona needle APCI, G1947-20029

## TIPS &amp; TOOLS

ES nebulizer (original) is compatible with the following ion sources:

- ESI G1948A with Serial Number < US91801994
- ESI G1948B with Serial Number < US91201787
- Multimode G1978A with Serial Number < US90800804
- Multimode G1978B with Serial Number < US90700787
- Dual ESI G3251A with Serial Number < US91200355
- Dual ESI G3251B with Serial Number < US91200355



LC/MS Supplies

Description	6100 Series	6200 Series	6300 Series	6400 Series	6500 Series	Part No.
	Single Quadrupole LC/MS			TOF LC/MS		
Syringe adapter			✓			9301-1291
Syringe pump			✓			3162-0178
1/16 in finger-tight PEEK fitting		✓	✓		✓	0100-1516
Female luer to female 10/32 adapter		✓	✓		✓	0100-2304
PEEK tubing		✓	✓		✓	0890-1915
Gas-tight syringe, PTFE Luer lock		✓	✓		✓	5182-9710
High-throughput skimmer, 2 mm		✓		✓	✓	G1969-20302
Skimmer 1 (G1956A/B)	✓					G1956-20302
HED assembly	✓					G1946-80019
HED assembly (G6140A, G6460A, G6530A)				✓		G2571-80103
HED assembly		✓				G1956-80000
Electron multiplier replacement horn	✓	✓		✓		05971-80103
Replacement horn and dynode	✓		✓	✓		G2441-80010



Electron multiplier replacement horn,  
05971-80103

**LC/MS Foreline Pump Supplies**

Description	Part No.
Oil mist filter kit for E1M18/E2M28	3162-1056
Oil mist cartridge filter for MS40+	G1960-80039
Oil return kit	3162-1057
Foreline pump (rotary pump) oil, Inland 45, 1 L, for E1M18/E2M28	6040-0834
Foreline pump (rotary pump) oil, 4 L, for E1M18/E2M28	6040-0798
Foreline exhaust adapter	59980-20134
Hose clamp	1400-0563
Oil mist filter element for E2M18	1535-4970
KF25 clamp, stainless steel	0100-0549
KF25 coseal (inside clamp)	0100-1597
Exhaust tubing	0890-1727
Pump oil drip pan	G1946-00034



Adding foreline pump (rotary pump) oil, 4 L

**LC/MS Chemicals**

Description	6100 Series		6300 Series	6400 Series		6500 Series	Part No.
	Single Quadrupole LC/MS	TOF LC/MS		Triple Quadrupole LC/MS	Accurate-Mass Q-TOF LC/MS		
ES/APCI positive ion performance standard, 5 x 1 mL ampoules	✓	✓		✓	✓		G2423A
Electrospray LC demo sample (Sulfamix)	✓			✓*			59987-20033
ESI+APCI LC demo sample	✓						G1978-85000
ES negative ion performance standard, 5 x 1 mL ampoules	✓			✓			G2424A
APCI negative ion performance standard, 5 x 1 mL ampoules	✓						G2425A
ES/APCI positive ion performance standard	✓						G1946-85004
Multiple-charge compound performance evaluation sample (horse heart myoglobin)	✓						G2426A
ES/APCI positive ion performance standard, 5 x 1 mL ampoules	✓						G2423A
ES-TOF reference mix, 6 x 2 mL ampoules		✓				✓	G1969-85001
ES-TOF biopolymer reference standard kit		✓					G1969-85003
Flushing solvent	✓	✓	✓	✓	✓		G1969-85026
High purity water, 4 L	✓	✓	✓	✓	✓		8500-2236
Methyl alcohol, 1 L	✓	✓	✓	✓	✓		8500-1867
Ammonium formate	✓	✓	✓	✓	✓		G1946-85021
Formic acid, 5 mL	✓	✓	✓	✓	✓		G2453-85060
Acetonitrile, 1 L	✓	✓	✓	✓	✓		G2453-85050

\*Recommended item for familiarization

**LC/MS Common Supplies\***

<b>Description</b>	<b>Part No.</b>
<b>Common Parts</b>	
Filter element, 5 µm, 5/pk	0100-2051
Rotor seal, Tefzel, pH 0 to 14	0100-1854
Rotor seal, Vespel, pH 0 to 10	0100-1855
Inlet filter assembly	G1946-60180
SSV long drain tubing assembly	G1969-60086
Spring, canted coil	1460-2571
<b>Cleaning Supplies</b>	
Abrasive mesh, 4000 grit	8660-0827
Capillary cleaning wire for dip tube	G1946-80054
Cleaning powder, dielectric capillary, Alconox	5190-1401
Cloths, lint-free	05980-60051
Cotton swabs, 100/pk	5080-5400
<b>Gas Purifiers</b>	
Big hydrocarbon trap, 1/4 in fittings	BHT-4
Big moisture trap, 1/4 in fittings	BMT-4
Big universal trap, 1/4 in fittings	RMSN-4
Big universal trap, 1/8 in fittings, Nitrogen	RMSN-2
<b>Tools</b>	
LC/MS tool kit	G1946-60157
Nebulizer adjustment fixture	G1946-20215
Nebulizer 25X magnifier	G1946-80049
Plastic tubing cutter	8710-1930
Screwdriver, Torx T15	8710-1622
Screwdriver, Torx T20	8710-1615
Open end wrench, 1/4 and 5/16 in	8710-0510
Wrench, 1/2 and 7/16 in	8710-0806
Needle nose pliers, pointed serrated jaws	8710-0004
3 mm wrench for nebulizer needle adjustment	8710-2699

\*These parts are common to all LC/MS systems



## Quiet Cover

Agilent has a solution to the frequent maintenance of LC/MS and ICP-MS rough pumps (visual check of oil levels, oil changes, oil additions, clean-up of oil leaks, etc.), as well as the inherent noise produced by the pumps. Quiet Covers are designed for easy movement, maintenance, and better living with rough pumps used with Agilent and other LC/MS systems.

- Locking castors to move heavy pump for maintenance
- No tools necessary to remove sectioned cover for easy access to pump
- Built in lift-and-tilt lever raises end of pump to drain oil
- Removable drip pan with well and hand holds to collect and transport oil
- Sound absorbing cabinet with resistant foam insulation to reduce pump noise
- Pump mounted to minimize vibration
- 2 Integrated fans maintain temperature inside cover
- LEDs and audible alarm if temperature exceeds 35 °C limit
- Maximum ambient temperature of 35 °C when airflow is neither restricted nor recycled
- Standard one-year warranty; installation and familiarization included with new LC/MS or ICP-MS orders

Please check [www.agilent.com/chem/quietcover](http://www.agilent.com/chem/quietcover) for the most up-to-date instrument compatibility guide.

Please confirm rough pump used in your Agilent system to ensure compatibility.

### Quiet Cover

Description	Compatible Pump Models	Part No.
Quiet Cover	BOC Edwards Pumps, E2M28, E2M18, or E1M18	G3199B
Quiet Cover MS	Agilent MS40+	G6011A
Quiet Cover DS	Agilent DS202, DS302, DS402, and DS602	G6012A
Quiet Cover TS	Agilent TS300, TS300INV, TS600, TS600INV, and TS800	G6013A
Quiet Cover GC/MS*	Agilent DS42, Pfeiffer Duo 2.5	G6014A

\*This model does not contain all features.



Quiet Cover MS, G6011A



Quiet Cover DS, G6012A



Quiet Cover MS, G6011A

## LC/MS Standards Kits

### LC/MS Standards Kits

Description	Part No.
Caffeine standards kit for LC/MS OQ/PV	8500-6917
Caffeine standards kit for LC/MS-Trap OQ/PV	5065-9908
Sulfa drug standards kit for LC/MS OQ/PV	5188-6523

### LC/MS Application Kit Standards

Description	Part No.
LC/MS pesticide checkout mixture	5190-0469
LC/MS pesticide comprehensive mixture	5190-0551
LC/MS toxicology checkout mixture	5190-0556
LC/MS toxicology comprehensive mixture	5190-0555
LC/MS vet drug checkout mixture	5190-0443
LC/MS vet drug comprehensive mixture	5190-0554

### LC/MS Calibrant Mixes

Description	Part No.
Calibrant, ES	G2421-60001
APCI/APPI calibrant solution, 100 mL	G2432A
ESI tuning mix for ion trap, 100 mL	G2431A
ES-TOF tuning mix, 100 mL	G1969-85000
APCI-L low concentration tuning mix, 100 mL	G1969-85010
MMI-L low concentration tuning mix, 100 mL	G1969-85020

## LC/MS Calibrant Mix and Source Compatibility Matrix

Source	6100 Series Single Quadrupole LC/MS*	6140A/6150B Single Quadrupole LC/MS	6200 Series TOF LC/MS	6300 Series Ion Trap LC/MS	6400 Series Triple Quadrupole LC/MS	6500 Series Accurate-Mass Q-TOF LC/MS
ESI	G2421-60001	G1969-85000	G1969-85000	G2431A	G1969-85000	G1969-85000
APCI	G2432A	G1969-85010	G1969-85010	G2432A	G1969-85010 <sup>2</sup>	G1969-85010 <sup>2</sup>
APPI	G2432A	G2432A	G1969-85010	G2432A	G2432A <sup>2</sup>	G1969-85010 <sup>2</sup>
MMI	G2432A	G1969-85000	G1969-85020	G2432A	G1969-85020	G1969-85020
NanoESI			G1969-85000 <sup>4</sup>	G2431A		G1969-85000 <sup>4</sup>
HPLC-Chip Cube		G1969-85000 <sup>2</sup>	G1969-85000 <sup>4</sup>	G2431A <sup>1</sup>	G1969-85000 <sup>3</sup>	G1969-85000 <sup>4</sup>

\*G6110A, G6120A/B, G6130A/B

<sup>1</sup>5X dilution suggested

<sup>2</sup>No autotune

<sup>3</sup>ESI positive tune only

<sup>4</sup>Calibration only



# Agilent CrossLab

Agilent CrossLab offers a growing portfolio of HPLC supplies manufactured for seamless performance with a variety of non-Agilent analytical instruments in your lab. Look inside this selection guide to find a wide range of products for your applications.

We currently support:

- Waters
- Shimadzu
- Dionex\*
- CTC Analytics
- And more to come

Our growing portfolio includes the following products:

- Autosampler syringes
- Capillaries, tubing, and fittings
- Detector lamps
- Performance Maintenance kits
- Pump supplies
- Sample loops
- Valve supplies
- Vials and closures
- Well plates and sealing mats

Agilent CrossLab is more than supplies:

- Over 40 years of chromatography expertise
- The right supplies for both routine and challenging applications
- Hassle-free operations and reproducible results
- High-quality products manufactured to Agilent standards
- Technical and application support
- Dependable worldwide availability and delivery
- Convenience of consolidating purchasing
- 90-day risk free money back guarantee

\*Dionex is now a part of Thermo Scientific

Agilent CrossLab works with **WATERS** | **SHIMADZU** | **THERMO SCIENTIFIC** | **AND MORE**

## CrossLab Detector Lamps

Our detector lamps are designed for precise alignment and thermal stability

Agilent CrossLab 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). All the lamps adhere to the tightest specifications for consistent quality and reproducible performance over the entire lifetime of the lamps. 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 each 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



Long-life deuterium lamp, 8005-0705

#### TIPS & TOOLS

Each time after a replacement of a detector lamp, it is recommended to perform a wavelength calibration test and an intensity test after warm up.



#### TIPS & TOOLS

An Agilent CrossLab Supplies Selection Tool is available to help you choose the correct supplies for your non-Agilent instrument. For more information, visit [www.agilent.com/chem/SelectCrossLab](http://www.agilent.com/chem/SelectCrossLab)





Snap top vials with write-on spot, 8010-0025

## CrossLab Vials and Closures

Agilent CrossLab vials and closures are thoroughly tested to ensure the highest level of quality. Additionally, CrossLab vials are designed for use in a wide range of non-Agilent GCs and LCs, including those from Bruker (formerly Varian), Dionex (now Thermo Scientific), PerkinElmer, Shimadzu, and Thermo Scientific. They are:

- 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

For Agilent CrossLab Vials and Closures ordering information please see the General Chromatography catalog (publication # 5991-1059EN)  
[www.agilent.com/chem/library](http://www.agilent.com/chem/library)

### TIPS & TOOLS



#### Easy, Reliable pH Testing, Designed for Chromatographers

Agilent now offers a full line of pH meters and electrodes. Designed for chromatographers, these pH meters offer intuitive user design and exceptional ruggedness for your lab.

Learn more at [www.agilent.com/chem/phmeters](http://www.agilent.com/chem/phmeters)



# CrossLab Well Plates and Sealing Mats

Choose the cleanest well plates and sealing mats for your autosamplers



96-well plate, 8010-0534

## Advantages of Agilent CrossLab well plates:

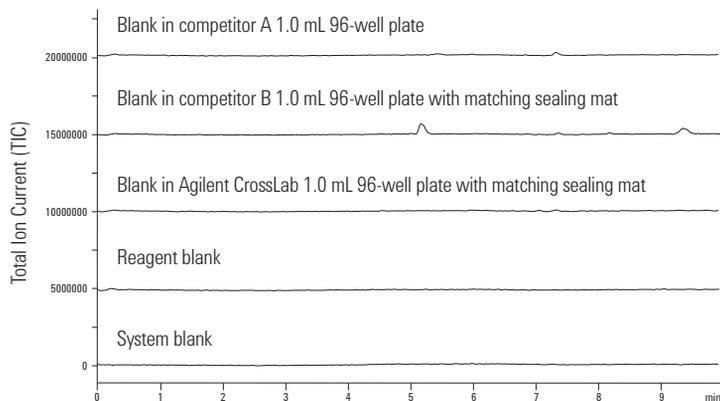
- Made from polypropylene
- Free from RNase, DNase, Endotoxins, and human DNA
- Chemically resistant to common solvents
- Autoclavable (121 °C/20 min)
- Alpha-numeric grid
- Compatible with pipetting workstations and multi-channel pipettes
- Raised rims are available with 0.5 mL and 1.0 mL deep well plates for efficient sealing and a reduced risk of cross-contamination during rigorous vortexing
- Available in 96- or 384-well plate format
- 96-well plates range from 0.2 mL to 2 mL
- 384-well plates available in 0.1 mL and 0.25 mL
- Stackable

## Advantages of Agilent CrossLab sealing mats:

- Protect well contents during storage
- Free from RNase, DNase, Endotoxins, and human DNA
- Highly flexible for a tight seal and exact fit
- Insets in every well eliminate the need for glue during connection
- Pierceable with pipette tips (0.5 mL and 1.0 mL sealing mats)
- Prevent solvent evaporation
- Made from thermoplastic elastomer (TPE) or ethylene-vinyl acetate (EVA)
- Compatible with common solvents

For Agilent CrossLab Well Plates and Sealing Mats ordering information please see the General Chromatography catalog (publication # 5991-1059EN)  
[www.agilent.com/chem/library](http://www.agilent.com/chem/library)

## Cleanliness of well plates and sealing mats: Agilent CrossLab vs. the competition



The chemical extraction experiments demonstrate the superior cleanliness of the Agilent CrossLab well plates and sealing mats compared to the competition, making them ideal for LC/MS applications.

LC/MS ESI positive chromatogram comparison. Reagent blank: 1:1 Acetonitrile/H<sub>2</sub>O with 0.1% formic acid

## CrossLab Autosampler Syringes and Manual Syringes

Agilent's CrossLab HPLC syringe portfolio contains a broad selection of syringe styles and volumes to provide what you need for accurate and effective sampling. From autosampler syringes in both large or small volume, to syringes for pump priming, CrossLab syringes meet all form, fit, and function criteria to support your HPLC systems.

- Accuracy to within  $\pm 1\%$  of nominal volume with a precision of 1% at 80% of the total volume
- A chemically inert fluid path of stainless steel, borosilicate Type I glass, or PTFE
- Robust design for long lifetime

### Agilent CrossLab Syringe Features



Syringe terminations at the end of the syringe barrel function as the interface between the syringe and its mating connection such as the needle. Terminations are offered in a number of different needle and connection configurations to accommodate a broad range of applications.

### Fixed Needle



- Economical option for injections
- Preferred for applications requiring trace level samples
- Needle is cemented into the glass syringe barrel at a point corresponding to the zero graduation mark
- Dead volume is limited to the needle's internal volume
- Not autoclavable
- Recommended for use where probability of needle bending is minimal

### Removable Needle



- Versatile option for injections
- Needle seats precisely at the zero graduation mark
- Needle can be replaced if damaged or clogged
- Allows for a removable needle without increasing dead volume
- Ideal for when there is a risk of needle clogging
- Autoclavable when disassembled (repeated autoclaving shortens syringe life)

### PTFE Luer Lock

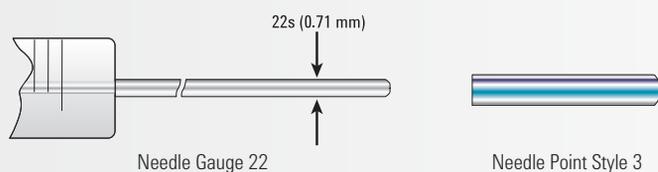


- PTFE, male Luer taper with nickel-plated brass locking hub for use with Kel-F needles or metal hub needles, and universal connectors
- Autoclavable when disassembled, except on 25 mL or greater syringes (repeated autoclaving shortens syringe life)

### Chem



- ¼-28 UNF male fitting thread connection
- Used for low-volume applications where system dead volume must be minimized
- Can be screwed directly into injection valves



**Note:** Most manual HPLC injection valves are designed to be used with a 22-gauge, or a 22s-gauge blunt needle point style 3.

### Gauge Selection Chart

Gauge	Nominal OD		Nominal ID		Wall Thickness		Volume
	in	mm	in	mm	in	mm	μL/in
22s*	0.0280 - 0.0285	0.718	0.0055 - 0.0077	0.168	0.022	0.55	0.563
22	0.0280 - 0.0285	0.718	0.0155 - 0.0170	0.413	0.012	0.30	3.403

\***Note:** 22s needles have a smaller inner diameter and a thicker wall for better durability.



### TIPS & TOOLS

Replace syringe if dirt is noticeable, syringes cannot be cleaned, or plunger does not slide easily.



### TIPS & TOOLS

Follow manufacturer's recommendation for syringe cleaning and regularly inspect syringe barrel for sample build-up and needle tip for wear.

## 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 generate 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 in-line 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

## Shimadzu Autosampler Routine Maintenance Procedures

- Replace the sample metering drive plunger seal
- Replace the sample needle
- Replace the needle seat seal
- If equipped, replace the rinse port septum
- If equipped, clean the high-pressure valve and replace the high-pressure valve rotor seal
- If equipped, clean the low-pressure valve and replace the low-pressure valve rotor seal
- If equipped, clean the injection valve and replace the injection valve rotor seal
- Adjust the needle if necessary

### Shimadzu 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 seal	Replace the metering plunger seal
	Damaged metering plunger	Replace the metering plunger
	Worn high-pressure valve seals	Rebuild the high-pressure valve
	Worn low-pressure valve seals	Rebuild the low-pressure valve
	Leaking waste valve	Replace the waste valve
	Damaged sample needle	Replace the sample needle and needle seat seal
Sample carryover	Needlewash solvent exhausted	Refill the needlewash solvent reservoir
	Dirty needlewash seals	Rebuild the seal pack and adjust seal pack seal values
	Contaminated rinse port	Clean and flush the rinse port
Low peak response	Low sample level in vials	Confirm sample level in the vials is at minimum a quarter full
	Worn metering plunger seal	Replace the metering plunger seal
	Damaged metering plunger	Replace the metering plunger
	Worn high-pressure valve seals	Rebuild the high-pressure valve
	Leaking waste valve	Replace the waste valve
	Damaged sample needle	Replace the sample needle and needle seat seal

## Dionex\* Autosampler Routine Maintenance Procedures

- Replace the sample metering syringe
- Replace the sample needle
- Replace the needle seat seal
- If equipped, clean the injection valve and replace the injection valve rotor seal
- Replace the buffer tubing
- Replace the capillary tubing
- Fill the syringe reservoir
- Adjust the needle if necessary

\*Dionex is now a part of Thermo Scientific

### Dionex 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 seal	Replace the metering syringe
	Worn syringe valve	Replace the syringe valve
	Worn injection valve seal	Rebuild the injection valve
	Leaking waste valve	Replace the waste valve
	Leaking fittings	Check all the fittings for leaks
	Damaged sample needle	Replace the sample needle and needle seat seal
Sample carryover	Needlewash solvent exhausted	Refill the needlewash solvent reservoir
	Dirty needlewash seals	Rebuild the seal pack and adjust seal pack seal valves
	Contaminated rinse port	Clean and flush the rinse port
Leaking syringe	Damaged syringe	Replace the syringe
	Worn syringe valve	Check for leaks and replace if necessary
Low peak response	Low sample level in vials	Confirm sample level in the vials is at minimum a quarter full
	Worn syringe valve	Replace the metering syringe
	Damaged syringe valve	Check the syringe valve for leaks and replace if necessary
	Worn injector valve seal	Rebuild the injection valve
	Leaking waste valve	Replace the waste valve
	Leaking fittings	Check all the fittings for leaks
	Damaged sample needle	Replace the sample needle and needle seat seal



Sapphire plunger assembly, 8005-0538



Plunger seal replacement kit, 8005-0541



Face seals replacement kit, 8005-0536

## CrossLab Pump Supplies

Proper pump maintenance helps ensure precise, consistent results and lower operating costs

Regular pump maintenance helps lower operating costs and ensure precise and consistent results. By following a regular maintenance routine, you can count on maximum uptime, steady and accurate solvent flow, pressure stability throughout the life of a pump, and keep your HPLC system in its optimum condition.

## CrossLab Plungers and Seals

Plungers (or pistons) and seals are two of the most important components of a pump. All Agilent CrossLab plungers combined with seals undergo extensive testing under temperature stress with common HPLC solvents for reproducible results.

### Plungers:

- Available in sapphire or ceramic
- Sapphire plungers are made from high purity monocrystalline sapphire for optimal concentricity and resistance to wear
- Are meticulously cut and polished for great durability and long life

### Seals:

- Manufactured from ultra-high-molecular-weight polyethylene (UHMWPE) or graphite-filled polytetrafluoroethylene (GFP)
- Designed to provide precise sealing around the plungers
- Engineered to deliver top performance over highly dynamic flow and pressure ranges

### TIPS & TOOLS



Plungers (or pistons) should be exchanged on a regular basis in combination with seals to maintain the best sealing surface and durability for optimal instrument performance.

### TIPS & TOOLS



Depending on your applications and solvent preparation protocols, some parts may need to be replaced more often than the others.

## CrossLab Check Valves

Check valves are key components for a pump, and their lifetime is often related to the solvents used. A defective valve can lead to pressure fluctuation, inconsistent flow, and a noisy baseline.

Agilent CrossLab check valves and assembly components:

- Made to operate at different pressures (up to 16,000 psi, or 1,100 bar) per specifications from the Original Equipment Manufacturers (OEMs)
- Made from a variety of materials, such as stainless steel, titanium, ceramic, and PEEK, depending on OEM specifications
- Carefully assembled to ensure reliability and consistent performance
- Each ruby or ceramic ball and sapphire or ceramic seat is manufactured under extremely tight tolerances to ensure proper sealing within the operating pressure range

### TIPS & TOOLS

Don't forget to check your check valve regularly and replace check valve cartridges to ensure proper pump operations.



## TIPS &amp; 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.



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 generate 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.

## Waters Pump Routine Maintenance Procedures

- Replace the seals and plungers (or pistons)
- Replace the in-line 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 in-line 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 in-line filter (5 mL/min H <sub>2</sub> O during wet priming)	Dirty in-line filter	Exchange the in-line 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 in-line 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

## Shimadzu Pump Routine Maintenance Procedures

- Replace the seals and plungers (or pistons)
- Replace the in-line filter cartridge
- Replace the check valve cartridges
- Replace the seal wash seals
- Replace the solvent inlet frits



Plunger seal, 8001-0502

### Shimadzu Pump Routine Maintenance and Troubleshooting

Symptom	Cause	Solution
Pressure ripple unstable	Dirty check valve cartridge(s)	Run Pump Pressure test to verify and exchange the check valve cartridge(s)
	Leak on pump head	Run Pump Pressure test to verify and exchange the in-line filter insert and plunger (or piston) seal Check inlet and outlet fittings for leaks Tighten all fittings and re-run the Pump Pressure test
Gradient performance problems Intermittent pressure fluctuations	Solvent filter(s) is blocked	Change the solvent filter(s)
A pressure drop of greater than 10 bar (150 psi) across the in-line filter (5 mL/min H <sub>2</sub> O during wet priming)	Dirty in-line filter	Exchange the in-line filter insert
Leaks at lower pump head side Unstable retention time Pressure ripple unstable Broad peaks or peak tailing	High seal wear	Run Pump Pressure test to verify and exchange the pump seals and in-line filter cartridge
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



Vespel rotor seal, 8002-0602

## Dionex\* Pump Routine Maintenance Procedures

- Replace the purge valve cap seal
- Replace the seals, seal rings, and plungers (or pistons)
- Replace the in-line filter cartridge
- Replace the check valve cartridges
- Replace the seal wash seals and seal wash tubing
- Replace the mixing chamber gasket
- Replace the solvent inlet filter frits

\*Dionex is now a part of Thermo Scientific

### Dionex Pump Routine Maintenance and Troubleshooting

Symptom	Cause	Solution
Pressure ripple unstable	Dirty check valve cartridge(s)	Run Pump Pressure test to verify and exchange the check valve cartridge(s)
	Leak on pump head	Run Pump Pressure test to verify and exchange the in-line filter insert and plunger (or piston) seal Check inlet and outlet fittings for leaks Tighten all fittings and re-run the Pump Pressure test
Gradient performance problems, Intermittent pressure fluctuations	Solvent filter(s) is blocked	Change the solvent filter(s)
A pressure drop of greater than 10 bar (150 psi) across the in-line filter (5 mL/min H <sub>2</sub> O during wet priming)	Dirty in-line filter	Exchange the in-line filter insert
Leaks at lower pump head side Unstable retention time Pressure ripple unstable Broad peaks or peak tailing	High seal wear	Run Pump Pressure test to verify and exchange the pump seals and in-line filter cartridge
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 and seal wash tubing

## CrossLab Valve Supplies

Agilent CrossLab valve supplies work seamlessly with your HPLC systems for reliable, accurate, and reproducible results.

### Rotor seals:

#### A variety of materials for a wide range of applications

A rotor seal is a polymeric disk that creates a high-pressure seal against the stator or stator face seal. A variety of materials are available for different applications. It is important to replace rotor seals on a routine basis to prevent excessive wear. The recommended replacement interval for most rotor seals is once per year for preventive maintenance or as needed depending on stresses imposed by specific applications.

- **Vespel:** Vespel is a polyimide with low wear and high chemical resistance. Recommended for use with solutions under pH 10; because more basic solutions dissolve Vespel over time and damage the rotor seal
- **PEEK (Polyetheretherketone):** PEEK offers high resistance, versatility, and applicability for the entire pH range between 0 and 14
- **Tefzel:** Recommended for use in applications where PEEK cannot be used, such as higher concentrations of methylene chloride or dimethyl sulfoxide (DMSO)

#### Recommended pH levels for rotor seal materials

pH Range	0-7	7-10	10-14
Vespel			
PEEK			
Tefzel			



Rotor, 6-port valve, 8001-0601

#### TIPS & TOOLS

For any solution above pH 10, a PEEK rotor seal is recommended.



#### TIPS & TOOLS

PEEK rotor seals are incompatible with concentrated nitric and sulfuric acids.





Stator, 6-port valve, 8001-0604

## Stators

- Available in 316 stainless steel, PEEK, and ceramic depending on the specifications of OEMs
- Typically require replacement only if the ports or sealing surfaces become damaged, which can be prevented by using proper injection needles.

## Sample Loops

### Stainless Steel Sample Loops:

- Have burr-free and square-cut ends to ensure a flush connection to valve ports
- Actual volumes might differ due to tolerance of metal tubing bore
- Accuracy of large metal loops (1.0 mm, 0.040 in bore) is  $\pm 14\%$ , intermediate loops (0.5 mm, 0.020 in bore) is  $\pm 21\%$ , and small loops (0.2 mm, 0.007 in bore) is  $\pm 65\%$

### PEEK Sample Loops

- Alternatives to stainless steel sample loops
- Clean, straight cuts for easy valve installation and low dead volume connections
- Inert to almost all organic solvents and biocompatible
- Actual volumes might differ due to tolerance of metal tubing bore
- Accuracy of large PEEK loops (0.8 mm, 0.030 in bore) is  $\pm 5\%$ , intermediate loops (0.5 mm, 0.020 in bore) is  $\pm 10\%$ , and small loops (0.2 mm, 0.007 in bore) is  $\pm 30\%$
- Wall thickness, temperature, concentration of organic solvent, and solvent exposure time affect the durability of PEEK tubing

### TIPS & TOOLS



Concentrated nitric acid and sulfuric acid weaken PEEK tubing while tetrahydrofuran (THF), methylene chloride, and DMSO cause swelling.

### TIPS & TOOLS



Since both standards and unknowns are usually analyzed using the same sample loops, knowledge of the actual, accurate volume is rarely needed. If the sample loop volume must be known, it is best to calibrate the loop in place on the valve so the flow passages in the valve are taken into account.

## CrossLab Performance Maintenance (PM) Kits

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

Many instrument failures are caused not 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.

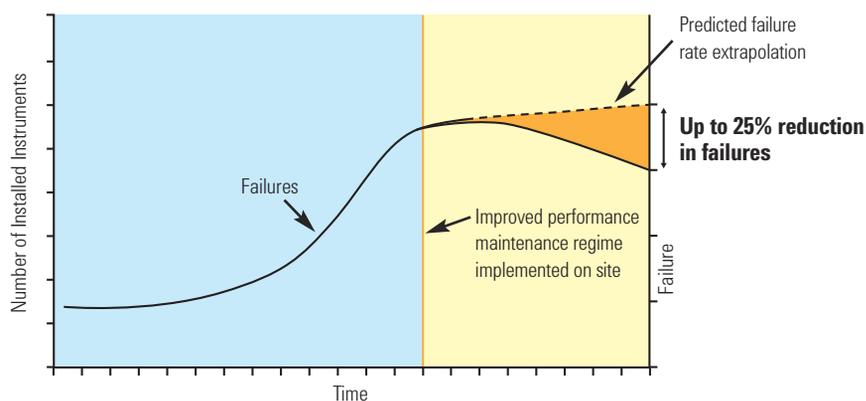


515 pump PM kit, 8005-0913



2960/2965 PM kit, 8005-0915

### The Effect of Performance Maintenance



Agilent CrossLab 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 useful life
- Eliminate individual part ordering
- PM kits available for pumps, valves, autosamplers, and HPLC systems

# General HPLC Supplies

## CrossLab LC Capillaries and Tubing

### Your link to analytical success

Agilent CrossLab offers a range of capillaries and tubing made from stainless steel and PEEK. Used in combination with the right fittings, they are ideal for LC system plumbing, providing an inert surface, tight, leak-free connections, and zero dead volumes.

### Stainless steel capillaries

- Made of ultra-clean stainless steel tubing
- Ideal for most standard applications, and the best choice for reliable high-pressure sealing
- Smooth inner surface for the lowest backpressure
- Precision cutting for burr-free, square-cut ends without inner-diameter distortion
- Both ends accept standard fittings
- Predefined lengths for specific path locations to avoid peak broadening
- Individually tested to ensure reproducibility
- Available in pre-swaged and non pre-swaged

#### TIPS & TOOLS



Always use the smallest capillary internal diameter and the shortest length to keep sample dispersion as low as possible.

### PEEK tubing

- Flexible and easy to cut to desired lengths
- Ideal for frequently changed connections
- Resists mechanical and solvent damage, even at high temperatures
- Biocompatible and inert to almost all organic solvents
- A durable alternative to stainless steel connections
- Accepts both stainless steel and PEEK fittings

## CrossLab Fittings

### The right LC fittings make the best LC connections

To ensure leak-free connections, and to prevent the loss of peak shape and resolution, always use the recommended fitting style for columns, valves and unions.

With Agilent CrossLab fittings, you get the confidence and choice that come with:

- Robust design for long life and smooth, leak-free operation
- Stainless steel nuts and ferrules for high-pressure systems
- Polymer fittings for biocompatible applications



## CrossLab HPLC In-Line Filters

### Help stop time-wasting blockages

Column inlet frit contamination can increase backpressure and reduce efficiency. Microbore column blockages are of particular concern, due to the frit's small diameter.

To help prevent time-wasting contamination and blockages, the Agilent CrossLab portfolio offers two types of LC filters made from clean, high-quality stainless steel parts:

- In-line solvent filters, installed between the LC pump and injector, prevent blockages by removing particles from solvents before they reach the injector
- Column inlet filters, positioned immediately before an LC column, remove particles from both the injection system and sample

# 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
Ghost peaks	Wavy or undulating – Temperature changes in room	Monitor room temperature and control
	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

(Continued)

## HPLC Troubleshooting

Symptom Type	Possible Cause	Solution
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
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 long
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 $\mu\text{m}$ porosity in-line 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

(Continued)

## HPLC Troubleshooting

Symptom Type	Possible Cause	Solution
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
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
Pressure fluctuation	Long retention times	Use gradient elution or stronger mobile phase
	Leaky check valve	Replace check valve
	Pump seal leaks	Replace pump seals
Pressure increasing	Buildup of particulates	Filter sample; in-line 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

(Continued)

## HPLC Troubleshooting

Symptom Type	Possible Cause	Solution
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 on-line 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
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
Sensitivity problem	Active sites on silica packing	Use higher coverage packing for stationary phase
	Peaks are outside of 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
Slow column equilibration times (ion-pairing)	Sample-related losses during preparation	Use internal standard during sample prep; optimize sample prep method
	Equilibration time slow for long-chain ion-pairing reagents	Use shorter alkyl chain ion-pair reagent

# CrossLab Supplies for Waters HPLC Systems

## Detector Lamps

Model	Description	Similar to OEM Part No.	Agilent CrossLab Part No.
2996 Photodiode Array Detector 996 Photodiode Array Detector ACQUITY UPLC 2996 Photodiode Array Detector	Long-life deuterium lamp, 2,000 hours	WAT052586	8005-0705
2487 Dual Wavelength Absorbance Detector 2488 Multichannel Absorbance Detector ACQUITY TUV Detector UPLC TUV 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

## Autosampler Syringes, 1/pk

Model	Volume (µL)	Description	Needle Gauge/Length (mm)/Tip	Similar to OEM Part No.	Agilent CrossLab Syringe	Agilent CrossLab Replacement Needle	Agilent CrossLab Replacement Plunger	Similar to OEM Part No.
2777 Compact Sample Manager	10	Fixed needle	22s/51/3	430000859	8010-0445*			
2777 Sample Manager	25	Fixed needle, gas tight	22s/51/3	430000861	8010-0441		8010-0457, 10/pk	700002212
	100	Fixed needle, gas tight	22s/51/3	430000864	8010-0442*		8010-0458, 10/pk	700002213
		Fixed needle, gas tight	22/51/3	430000863	8010-0446*		8010-0459, 10/pk	700002214
	250	Fixed needle, gas tight	22/51/3	430000865	8010-0467		8010-0459, 10/pk	700002214
	500	Fixed needle, gas tight	22/51/3	430000866	8010-0468		8010-0456, 10/pk	700002215
	1,000	Fixed needle, gas tight	22/51/3	430000867	8010-0443		8010-0460, 10/pk	700002216
	2,500	Fixed needle, gas tight	22/51/3	430000868	8010-0444		8010-0455, 1/pk	700002217
						8010-0448, 1/pk	700002218	

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

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

(Continued)



Long-life deuterium lamp, 8005-0705



Long-life deuterium lamp, 8005-0704



Long-life deuterium lamp, 8005-0702

## CrossLab Supplies for Waters HPLC Systems

### Autosampler Syringes, 1/pk

Model	Volume (µL)	Description	Needle Gauge/Length (mm)/Tip	Similar to OEM Part No.	Agilent CrossLab Syringe	Agilent CrossLab Replacement Needle	Agilent CrossLab Replacement Plunger	Similar to OEM Part No.
510 HPLC Pump 515 HPLC Pump 600 MultiSolvent Delivery System CapLC System CapLC XE System	10000	Luer Lock	No needle	WAT025559	8005-0414			
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	25	Chem (1/4-28 UNF screw threads), gas tight	No needle	WAT077343	8005-0420			
2695 Separations Module 2695D Dissolution Separations Module 2790 Separations Module 2795 Separations Module LC Module 1 717/717plus Autosampler	250	Chem (1/4-28 screw threads UNF), 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	

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Autosampler syringe, gas tight, 8005-0417

## CrossLab Supplies for Waters HPLC Systems

### Pump Supplies

Model	Description	Unit	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Plungers and Seals</b>				
2690 Separations Module	Sapphire plunger assembly, standard	1/pk	WAT270959	8005-0538
2690D Dissolution Separations Module				
2695 Separations Module				
2695D Dissolution Separations Module				
2790 Separations Module				
2795 Separations Module				
2796 Bioseparations Module				
2690 Separations Module	Plunger seals, clear	2/pk	700001326	8005-0514
2690D Dissolution Separations Module				
2695 Separations Module				
2695D Dissolution Separations Module				
2690 Separations Module	Plunger seal replacement kit, standard, yellow	2/pk	WAT270938	8005-0535
2690D Dissolution Separations Module				
2695 Separations Module				
2695D Dissolution Separations Module				
2790 Separations Module				
2795 Separations Module				
Alliance GPC/V 2000 Systems				
2690 Separations Module	Plunger seal replacement kit, black	2/pk	WAT271066	8005-0541
2690D Dissolution Separations Module				
2695 Separations Module				
2695D Dissolution Separations Module				
2790 Separations Module				
2795 Separations Module				
2690 Separations Module	Face seals replacement kit	4/pk	WAT270939	8005-0536
2690D Dissolution Separations Module				
2695 Separations Module				
2695D Dissolution Separations Module				
2790 Separations Module				
2795 Separations Module				
Alliance GPC/V 2000 Systems				

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(Continued)



Plunger seal replacement kit,  
8005-0535



Plunger seal replacement kit,  
8005-0541



Face seals replacement kit,  
8005-0536

## CrossLab Supplies for Waters HPLC Systems

## Pump Supplies

Model	Description	Unit	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Plungers and Seals</b>				
2690 Separations Module	Seal wash face seal kit	1/pk	WAT271017	8005-0539
2690D Dissolution Separations Module				
2695 Separations Module				
2695D Dissolution Separations Module				
2790 Separations Module				
2795 Separations Module				
Alliance GPC/V 2000 Systems				
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	Seal wash plunger seal replacement kit	2/pk	WAT271018	8005-0540
2690D Dissolution Separations Module				
2695 Separations Module				
2695D Dissolution Separations Module				
2790 Separations Module				
2795 Separations Module				
Alliance GPC/V 2000 Systems				
510 HPLC Pump	Sapphire plunger	1/pk	WAT025656	8005-0527
600 MultiSolvent Delivery System	Oriented sapphire plunger	1/pk	WAT069511	8005-0533
610 PowerLine Isocratic Pump				
LC Module 1				
510 HPLC Pump	Plunger seal, graphite-filled PTFE (GFP), black	1/pk	WAT026613	8005-0529
515 HPLC Pump				
600 MultiSolvent Delivery System				
LC Module 1				
510 HPLC Pump	Plunger seal, black, 225 µL	1/pk	WAT026644	8005-0530
515 HPLC Pump				
600 MultiSolvent Delivery System				
610 PowerLine Isocratic Pump				
LC Module 1				
616 LC System	Sapphire plunger	1/pk	WAT031788	8005-0531
626 LC System				
1515 HPLC Pump	Sapphire plunger assembly	1/pk	WAS207069	8005-0523
1525 HPLC Pump				
515 HPLC Pump				



Seal wash face seal kit,  
8005-0539

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(Continued)

## CrossLab Supplies for Waters HPLC Systems

### Pump Supplies

Model	Description	Unit	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Plungers and Seals</b>				
1515 HPLC Pump	Plunger seal, clear	1/pk	WAT022934	8005-0524
1525 HPLC Pump	Plunger seal, clear	4/pk	WAT022946	8005-0525
510 HPLC Pump				
515 HPLC Pump				
600 MultiSolvent Delivery System				
610 PowerLine Isocratic Pump				
LC Module 1				
<b>Check Valves and Cartridges</b>				
2690 Separations Module	Check valve cartridge replacement kit	2/pk	WAT270941	8005-0537
2690D Dissolution Separations Module				
2695 Separations Module				
2695D Dissolution Separations Module				
2790 Separations Module				
2795 Separations Module				
Alliance GPC/V 2000 Systems				
626 LC System	Check valve cartridge	1/pk	WAT024120	8005-0526
1515 HPLC Pump	Check valve cartridge	2/pk	700000254	8005-0513
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				
1525 HPLC Pump	Check valve cartridge	1/pk	700002399	8005-0508
2695 Separations Module				
2695D Dissolution Separations Module				
2795 Separations Module				
515 HPLC Pump				
600 MultiSolvent Delivery System				

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(Continued)

## CrossLab Supplies for Waters HPLC Systems

## Pump Supplies

Model	Description	Unit	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Check Valves and Cartridges</b>				
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

## Detector Supplies

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

## Valve Replacement Parts, 1/pk

Model	Description	Unit	Similar to OEM Part No.	Agilent CrossLab Part No.
2767/2747 Sample Manager Column/Fluidics Organizer	Stator, 6 port, stainless steel		700001560	8005-0601
Rheodyne 7725(i) Injector	Vespel rotor seal, for Rheodyne 7725(i)		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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(Continued)

## CrossLab Supplies for Waters HPLC Systems

### Sample Loops, 1/pk

Model	Volume (µL)	Material	Similar to OEM Part No.	Agilent CrossLab Part No.
2690 Separations Module	100	Stainless steel	430001194	8005-0840
2690D Dissolution Separations Module				
2695 Separations Module				
2695D Dissolution Separations Module				
2695 Separations Module	200	Stainless steel	430001630	8005-0841
2695D Dissolution Separations Module				
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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## CrossLab Supplies for Waters HPLC Systems

### Performance Maintenance Kits

Model	Description	Kit Contents	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Performance Maintenance Kits for Separation Modules</b>				
2690 Separations Module 2690D Dissolution Separations Module 2695 Separations Module 2695D Dissolution Separations Module	2690/95 Performance Maintenance Kit	Contains 2 sapphire plungers, 2 seal wash plunger seal kits, 2 plunger seals replacements kits (standard, yellow), 4 wash tube seal replacement kits, 1 battery, 1 diffuser assembly, 4 face seal replacement kits, 4 solvent reservoir filters (10 µm), 1 250 µL syringe, 1 precolumn filter insert assembly, 2 check valve cartridges, 1 seal pack rebuild kit with needle, 1 wash tube seal, 1 sealwash tube, 1 PTFE washer, 1 filter retainer, 1 lower wash seal frit, 1 needlewash frit, 1 TFE washer, 1 needle assembly, 2 injector seals, 1 stainless steel ferrule 1/16 in, 1 compression screw	WAT270944	8005-0915
2690 Separations Module 2690D Dissolution Separations Module 2695 Separations Module 2695D Dissolution Separations Module	Seal Pack Rebuild Kit With Needle	Contains 1 wash tube seal, 1 sealwash tube, 1 PTFE washer, 1 filter retainer, 1 lower wash seal frit, 1 needlewash frit, 1 TFE washer, 1 needle assembly, 2 injector seals, 1 stainless steel ferrule 1/16 in, 1 compression screw	WAT271019	8005-0916
<b>Performance Maintenance Kits for Pumps</b>				
515 HPLC Pump	515 Pump Performance Maintenance Kit	Contains 2 sapphire plunger assemblies, 2 plunger seals, 1 solvent reservoir filter (10 µm), 1 sparge diffuser, 4 check valve cartridges	WAT052587	8005-0913
600 MultiSolvent Delivery System 610 PowerLine Isocratic Pump	600 Pump Performance Maintenance Kit	Contains 2 sapphire plungers, 2 plunger seals, 4 solvent reservoir filters (10 µm), 4 check valve cartridges, 1 reference valve rebuild kit, 1 inlet manifold rebuild kit, 4 sparge diffusers	WAT052675	8005-0930
616 LC System	616 LC Performance Maintenance Kit	Contains 2 sapphire plungers, 1 plunger seal kit (ultra high molecular weight polyethylene, yellow), 4 check valve cartridges, 4 sparge diffusers, 4 solvent reservoir filters (10 µm)	WAT052672	8005-0928

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(Continued)



2960/2965 PM kit, 8005-0915



515 pump PM kit, 8005-0913

## CrossLab Supplies for Waters HPLC Systems

### Performance Maintenance Kits

Model	Description	Kit Contents	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Performance Maintenance Kits for Pumps</b>				
626 LC System	626 LC Performance Maintenance Kit	Contains 2 sapphire plungers, 2 ultra high molecular weight polyethylene plunger seals (yellow), 4 solvent reservoir filters (10 µm), 4 check valve cartridges, 4 sparge diffusers	WAT052673	8005-0929
1515 HPLC Pump	1515 Pump Performance Maintenance Kit	Contains 2 sapphire plungers, 2 plunger seals, 4 check valve cartridges, 1 reference valve rebuild kit, 1 solvent reservoir filter (10 µm)	201000113	8005-0925
1525 HPLC Pump	1525 Pump Performance Maintenance Kit	Contains 4 sapphire plungers, 4 plunger seals, 8 check valve cartridges, 1 reference valve rebuild kit, 2 solvent reservoir filters (10 µm)	201000114	8005-0926
616 LC System	Plunger and Wash Seal Rebuild Kit	Contains parts for both pump heads, 2 plunger seals, 2 plunger wash seals, 2 retainer seal O-rings, 6 plunger bearings	WAT031790	8005-0912
626 LC System				
1515 HPLC Pump	Reference Valve Rebuild Kit	Contains 1 diaphragm for check valve, 1 gasket for check valve, 1 reference valve button	WAT025746	8005-0911
1525 HPLC Pump				
510 HPLC Pump				
515 HPLC Pump				
600 MultiSolvent Delivery System				
610 PowerLine Isocratic Pump	Outlet Check Valve Rebuild Kit	Contains 2 ball and seat for outlet check valves, 2 polychlorotrifluoroethylene (PCTFE) inserts, 2 stainless steel cup filters (2 µm), 4 large PTFE washers, 2 small PTFE washers	WAT026014	8005-0528
510 HPLC Pump				
515 HPLC Pump				
600 MultiSolvent Delivery System				
610 PowerLine Isocratic Pump				
LC Module 1				

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## CrossLab Supplies for Waters HPLC Systems

## Performance Maintenance Kits

Model	Description	Kit Contents	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Performance Maintenance Kits for Pumps</b>				
510 HPLC Pump 515 HPLC Pump 600 MultiSolvent Delivery System 610 PowerLine Isocratic Pump LC Module 1	Inlet Check Valve Rebuild Kit	Contains 2 ball and seat for inlet check valves, 2 retainer gaskets, 2 TFE washers, 2 PTFE washers, 2 PCTFE inserts	WAT060495	8005-0914
<b>Performance Maintenance Kits for Autosamplers</b>				
717 Autosampler	717 Autosampler Performance Maintenance Kit	Contains 1 seal pack replacement kit, 1 250 µL syringe, 1 filter (2.3 x 11.5 in), 2 filters (2 x 7 in)	WAT052669	8005-0927
<b>Performance Maintenance Kits for Rheodyne Valves</b>				
Rheodyne Injector, 3725(i)	Performance Maintenance Kit for Rheodyne 3725(i) Injector Valves	Contains 1 rotor seal (PEEK), 1 stator face assembly (PEEK), 1 isolation seal, 1 needle guide, 1 needle port cleaner, 1 5/64 in hex key, 1 9/64 in hex key	201000116	8005-0901
Rheodyne Injector, 7010	Performance Maintenance Kit for Rheodyne 7010 Injector Valves	Contains 1 isolation seal, 1 rotor seal (Vespel), 1 5/64 in hex key, 1 9/64 in hex key	201000117	8005-0902
Rheodyne Injector, 7125 and 7126	Performance Maintenance Kit for Rheodyne 7125 and 7126 Injector Valves	Contains 1 rotor seal (Vespel), 1 stator face assembly (PEEK/ceramic), 1 isolation seal, 1 needle guide, 1 needle port cleaner, 1 5/64 in hex key, 1 9/64 in hex key, instructions	201000118	8005-0903
Rheodyne Injector, 7725(i)	Performance Maintenance Kit for Rheodyne 7725(i) Injector Valves	Contains 1 stator face assembly (PEEK/ceramic), 1 rotor seal (Vespel), 1 isolation seal, 1 needle guide, 1 needle port cleaner, 1 5/64 in hex key, 1 9/64 in hex key, instructions	201000119	8005-0904
Rheodyne Injector, 7750E	Performance Maintenance Kit for Rheodyne 7750 Injector Valves	Contains 1 stator face assembly (PEEK/ceramic), 1 rotor seal (Vespel), 1 isolation seal, 1 9/64 in hex key, instructions	201000122	8005-0907

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(Continued)



Rheodyne 7725(i) PM kit, 8005-0904

## CrossLab Supplies for Waters HPLC Systems

### Performance Maintenance Kits

Model	Description	Kit Contents	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Performance Maintenance Kits for Rheodyne Valves</b>				
Rheodyne Injector, 7750E-075	Performance Maintenance Kit for Rheodyne 7750E-075 Valves	Contains 1 rotor seal (PEEK), 1 stator face seal (PEEK), 1 isolation seal, 1 9/64 in hex key, instructions	201000125	8005-0908
Rheodyne Injector, 8125 and 8126	Performance Maintenance Kit for Rheodyne 8125 and 8126 Injector Valve	Contains 1 stator face assembly (PEEK/ceramic), 1 rotor seal (PEEK), 1 isolation seal, 1 needle guide, 1 needle port cleaner, 1 5/64 in hex key, 1 9/64 in hex key, instructions	201000120	8005-0905
Rheodyne Injector, 9125 and 9126	Performance Maintenance Kit for Rheodyne 9125 and 9126 Injector Valves	Contains 1 stator face assembly (PEEK/ceramic), 1 rotor seal (Tefzel), 1 isolation seal, 1 needle guide, 1 needle port cleaner, 1 5/64 in hex key, 1 9/64 in hex key, instructions	201000121	8005-0906

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Rheodyne 9125 PM kit, 8005-0906

## CrossLab Supplies for Waters HPLC Systems

### HPLC Capillaries, 1/pk

Model	From	To	Material	OD (mm)	ID (mm)	Length (mm)	Fittings	Similar to OEM Part No.	Agilent CrossLab 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	6000	With fittings, non pre-swaged	430000922	8005-0812
Alliance	Column Thermostat Valve	Column	Stainless steel	1.6	0.23	3000	No fittings	WAT026973	8005-0823
	Column	Detector							
Alliance	Column Thermostat Valve	Column	Stainless steel	1.6	0.508	3000	No fittings	WAT026804	8005-0826
	Column	Detector							
Alliance	Column Thermostat Valve	Column	Stainless steel	1.6	1.02	3000	No fittings	WAT026805	8005-0822
	Column	Detector							
<b>Fittings</b>									
Alliance	Compression screws and ferrules							WAT025604	8005-0835*

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

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## CrossLab Supplies for Waters HPLC Systems

### HPLC Fittings, Ferrules, and Unions

Description	Unit	Similar to OEM Part No.	Agilent CrossLab 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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Please visit [www.agilent.com/chem/CrossLabHPLC](http://www.agilent.com/chem/CrossLabHPLC) for up-to-date info for the growing portfolio of CrossLab LC Supplies for your non-Agilent HPLC systems.



For Agilent CrossLab Vials and Closures ordering information please see the General Chromatography catalog (publication # 5991-1059EN) [www.agilent.com/chem/library](http://www.agilent.com/chem/library)

For Agilent CrossLab Well Plates and Sealing Mats ordering information please see the General Chromatography catalog (publication # 5991-1059EN) [www.agilent.com/chem/library](http://www.agilent.com/chem/library)



# CrossLab Supplies for Shimadzu HPLC Systems



Long-life deuterium lamp, 8001-0701



Long-life deuterium lamp, 8001-0702



Long-life deuterium lamp, 8001-0704

## Detector Lamps, 1/pk

Model	Description	Similar to OEM Part No.	Agilent CrossLab Part No.
SPD-M10Avp	Long-life deuterium lamp, 2,000 hours	228-34016-00	8001-0701
SPD-M20A	Tungsten lamp, 1,200 hours	228-34410-91 228-34410-00	8001-0703
SPD-20A/AV SPD-10A/AVvp SPD-10AV	Long-life deuterium lamp, 2,000 hours	228-34016-02	8001-0702
SPD-20AV SPD-10AVvp SPD-10AV	Tungsten lamp, 1,200 hours	670-14602-00	8001-0705
LC-2010 LC-2010HT	Long-life deuterium lamp, 2,000 hours	228-37401-00	8001-0704

## Autosampler Syringes, 1/pk

Model	Volume (µL)	Description	Similar to OEM Part No.	Agilent CrossLab Syringe	Agilent CrossLab Replacement Plunger	Agilent CrossLab Replacement Barrel
SIL-10A SIL-10Ai	500	Chem (1/4-28 UNF screw threads), gas tight	228-25237-04	8001-0401	8001-0403	8001-0405
SIL-10A SIL-10Ai	2,500	Chem (1/4-28 UNF screw threads), gas tight	228-25237-06	8001-0402	8001-0406	

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Autosampler syringe, 8001-0401



Replacement syringe plunger, 500 µL, 8001-0403

## CrossLab Supplies for Shimadzu HPLC Systems

### Pump Supplies, 1/pk

Model	Description	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Plungers and Seals</b>			
LC-10ADvp LC-2010 (HT)	Sapphire plunger	228-35601-92 228-34498-91	8001-0503
LC-20AD LC-20ADXR LC-20AB	Sapphire plunger	228-35601-93	8001-0504
LC-20AT	Sapphire plunger assembly	228-35009-93	8001-0501
LC-2010	Sapphire plunger assembly	228-35281-93	8001-0514
LC-10ATvp	Ceramic plunger assembly	228-35009-92	8001-0533
LC-10ADvp	Ceramic plunger assembly	228-35601-91	8001-0534
LC-10ADvp LC-20AD/20ADxr/AB LC-30	Plunger holder	228-35602-91	8001-0515
LC-10AD/ADvp/LC-600/LC-9A LC-20AD/AB LC-2010 A/C (HT)	Plunger seal, graphite-filled PTFE (GFP)	228-35146-00	8001-0502
LC-10ATvp SIL-10ADvp SIL-20A/AC LC-20AT LC-2010 A/C LC-2010HT SIL-HT	Plunger seal, graphite-filled PTFE (GFP)	228-35145-00	8001-0522



Plunger seal, 8001-0502

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## CrossLab Supplies for Shimadzu HPLC Systems

**Pump Supplies, 1/pk**

<b>Model</b>	<b>Description</b>	<b>Similar to OEM Part No.</b>	<b>Agilent CrossLab Part No.</b>
<b>Plungers and Seals</b>			
LC-20AD/20AB and LC-10ADvp	Plunger seal, polyethylene	228-32628-00	8001-0530
LC-10ATvp/10AT/10AS	Plunger seal, polyethylene	228-21975-00	8001-0527
LC-10AS/10AT/10ATvp	Plunger rinse seal, polyethylene	228-28499-00	8001-0615
LC-20AT	Rinse seal	228-35935	8001-0520
LC-20AT	Back-up ring for ring seal	228-35934	8001-0516
LC-20AT	Plunger seal spacer	228-42700	8001-0510
LC-10AD LC-10ADvp LC-2010 LC-20AD/AB	PTFE diaphragms, 2/pk	228-32784-91	8001-0513
<b>Check Valves and Cartridges</b>			
LC-10AT/ATvp	Check valve IN	228-32166-91	8001-0528
LC-10ADvp	Check valve IN	228-39093-92	8001-0535
LC-10ADvp/ATvp	Check valve OUT	228-34976-91	8001-0532
LC-10AD and LC-600 and LC-9A	Check valve IN	228-33492-91	8001-0531
LC-10AT/AD and LC-600 and LC-9A	Check valve OUT	228-32531-92	8001-0529
LC-20AD/AB <sub>XR</sub>	Check valve IN	228-48249-91 228-45557-91	8001-0511
LC-20AD/AB LC-10ADvp/ATvp	Outlet check valve	228-45705-91 228-45563-95	8001-0521
LC-2010 LC-2010HT	Inlet valve cartridge	228-37149-92 228-37149-91	8001-0519
LC-2010 LC-2010HT	Outlet check valve	228-37147-93 228-37147-92	8001-0506
LC-20AT	Primary inlet check valve assembly	228-48249-93	8001-0512

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**Looking for Performance Maintenance Kits for Rheodyne Valves?**  
Please see pages 144-147.

## CrossLab Supplies for Shimadzu HPLC Systems

### Valve Replacement Parts, 1/pk

Model	Description	Similar to OEM Part No.	Agilent CrossLab Part No.
SiL-10A/10Ai/10A <sub>XL</sub>	Rotor, 6-port valve	228-21217-91	8001-0601
SIL-10ADvp	Rotor, 6V assembly, stainless steel surround	228-21217-97	8001-0603
SIL-10A/10Ai	Stator, 6-port valve	228-21220-91	8001-0604
SIL-20A/AC LC-2010	Stator, 5-port low pressure valve (LPV)	228-36917-01	8001-0607
SIL-20A/AC SIL-HT	Rotor, PEEK, high pressure valve (HPV)	228-41310-92 228-40750-92	8001-0612
LC-2010	Rotor, Vespel, high pressure valve (HPV)	228-38556-01	8001-0609
SIL-20A/AC	High pressure stator assembly for SIL-20A/AC	228-45408-91	8001-0613
LC-2010 LC-2010HT SIL-20 SIL-HT	Rotor, PEEK, low pressure valve (LPV)	228-36923-00	8001-0608
LC-10ADvp LC-10ATvp SIL-10ADvp LC-20AT LC-2010/HT	O-ring for drain valve, perfluoroelastomer	670-11518	8001-0614



Rotor, 6-port valve, 8001-0601



Stator, 6-port valve, 8001-0604



PEEK rotor, low pressure valve (LPV), 8001-0608

### Sample Loops, 1/pk

Model	Volume (µL)	Material	Similar to OEM Part No.	Agilent CrossLab Part No.
SIL-20A/AC	100	Stainless steel	228-45402-91 228-45402-95	8001-0814
SIL-10ADvp	100	Stainless steel, extended for pre-treatment	228-39751-92	8001-0812
LC-2010 LD-2010HT SIL-HT	100	Stainless steel	228-41370-91 228-37549-91	8001-0809
	100	Stainless steel, 1/16 in	220-90800-20	8001-0801
	100	Stainless steel, 1/8 in	220-90800-30	8001-0802

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## CrossLab Supplies for Shimadzu HPLC Systems

## Performance Maintenance Kits

Model	Description	Kit Contents	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Performance Maintenance Kits for Pumps</b>				
LC-20AT	Rinse seal holder assembly	Contains 1 rinse seal, 1 stainless steel rinse seal holder, 1 back up ring, 1 perfluoroelastomer O-ring for drain valve	228-35946-92	8001-0517
<b>Performance Maintenance Kits for Valves</b>				
SIL-10ADvp	Stator assembly for SIL-10ADvp	Contains 1 ceramic rotor, 1 stator, 1 housing C manifold with intermediate plate	228-36730-91 228-39349-01 228-39755-91	8001-0610
LC-2010	Stator assembly for LC-2010	Contains 1 housing C manifold (stainless steel) packing, 1 stator, and pins	228-40254-91	8001-0509

## HPLC Capillaries, 1/pk

Model	From	To	Material	OD (mm)	ID (mm)	Length (mm)	Fittings	Similar to OEM Part No.	Agilent CrossLab Part No.
LC-2010	Autosampler	Column	Flexible stainless steel	0.6	0.17	200	No fittings	228-38043-91	8001-0810
SIL-10ADvp	Injector	High pressure valve port #1	Flexible stainless steel	0.6	0.13	200	With fittings, non pre-swaged	228-39756-92	8001-8020
SIL-10ADvp SIL-20A/AC	Pump	Autosampler	Stainless steel	1.6	0.3	600	No fittings	228-22306-00	8001-0818
LC-20AP			Stainless steel	1.6	0.8	2000	No fittings	228-49820-00 228-50579-43	8001-0821
LC-20AT LC-20AD SIL-10ADvp			Stainless steel	1.6	0.3	2000	No fittings	228-36993-96 228-50579-91	8001-0822

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## CrossLab Supplies for Shimadzu HPLC Systems

### Tubing

Model	Description	OD (mm)	ID (mm)	Length (mm)	Fittings	Similar to OEM Part No.	Agilent CrossLab Part No.
LC-2010 LC-20AD	ETFE tubing for use between the inlet block and the check valve	1.6	0.8	3000	No fittings	228-18495-01	8001-0807
LC-2010 SII-20A/AC	FEP tubing	3	1.5	3000	No fittings	670-10321-05	8001-0823
SPD-20A/AV SPD-M20A	PEEK tubing	1.6	0.25	500	No fittings	670-10324-01 228-33376-50	8001-0824

### HPLC Fittings, Ferrules, and Unions

Model	Description	Unit	Similar to OEM Part No.	Agilent CrossLab Part No.
LC-2010	PTFE ferrule, 3.0 F-T	1/pk	228-12493-00	8001-0803
LC-20AT LD-20AD	Stainless steel ferrule, 1.6 F	1/pk	228-16000-10	8001-0816
LC-2010	Flangeless nut, M6	1/pk	228-39999-05	8001-0813
SIL-20A/AC LC-20AT LC-20AD	Stainless steel male nut, 1.6 MN, for 1/16 in tubing	1/pk	228-16001-00	8001-0805
SIL-10ADvp SIL-20A/AC	Stainless steel male nut, 1.6 MN, W6 (taller hex portion)	1/pk	228-16001-03	8001-0806
LC-20AD/AB LC-10ADvp	PEEK male nut, 1.6 MN, for plumbing line between inlet block and check valve	1/pk	228-35403-00	8001-0819
	PEEK male nut, fingertight for 1/16 in tubing	1/pk	228-18565-84	8001-0817

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## CrossLab Supplies for Shimadzu HPLC Systems

## HPLC In-Line Filters

Model	Description	Unit	Similar to OEM Part No.	Agilent CrossLab Part No.
LC-2010	Stainless steel in-line filter	1/pk	228-35871-96	8001-0808
LC-20AD/AB/AT			228-35871-94	
LC-10ADvp/ATvp				

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Please visit [www.agilent.com/chem/CrossLabHPLC](http://www.agilent.com/chem/CrossLabHPLC) for up-to-date info for the growing portfolio of CrossLab LC Supplies for your non-Agilent HPLC systems.



For Agilent CrossLab Vials and Closures ordering information please see the General Chromatography catalog (publication # 5991-1059EN)  
[www.agilent.com/chem/library](http://www.agilent.com/chem/library)



For Agilent CrossLab Well Plates and Sealing Mats ordering information please see the General Chromatography catalog (publication # 5991-1059EN)  
[www.agilent.com/chem/library](http://www.agilent.com/chem/library)

# CrossLab Supplies for Dionex HPLC Systems

## Detector Lamps, 1/pk

Model	Description	Similar to OEM Part No.	Agilent CrossLab Part No.
VWD-3000 Series MWD-3000 Series DAD-3000 Series	Long-life deuterium lamp, 2,000 hours	6074.1110	8002-0703
VWD-3000 Series MWD-3000 Series DAD-3000 Series	Tungsten lamp, 2,000 hours	6074.2000	8002-0705
UVD-3000	Long-life deuterium lamp, 2,000 hours	6073.2070	8002-0702
UVD 170/340 UVD 160/320	Long-life deuterium lamp, 2,000 hours	5053.1204	8002-0701
PDA-100 AD-25	Long-life deuterium lamp, 2,000 hours	939016T	8002-0704
PDA-100 AD-25	Tungsten lamp, 5,000 hours	056123T	8002-0706



Long-life deuterium lamp, 8002-0701

## Autosampler Syringes, 1/pk

Model	Volume (µL)	Description	Similar to OEM Part No.	Agilent CrossLab Syringe	Agilent CrossLab Replacement Needle (Needle Gauge/Length (mm)/Tip)	Agilent CrossLab Replacement Plunger
WPS-3000SL	25	Chem (1/4-28 UNF screw threads), gas tight	6822.0001	8002-0405		
	250	Chem (1/4-28 UNF screw threads), gas tight	6822.0003	8002-0407		
ASI-100	100	Removable needle, gas tight	5805.2920	8002-0401*	8002-0413, 22/51/3, 6/pk 8002-0412, 22s/51/3, 6/pk	8002-0402
	1,000	Removable needle, gas tight	5805.2940	8002-0403*	8002-0414, 22/51/3, 6/pk 8002-0415, 22s/51/3, 6/pk	8002-0406
	2,500	Removable needle, gas tight	5805.2950	8002-0404*	8002-0414, 22/51/3, 6/pk 8002-0415, 22s/51/3, 6/pk	8002-0408

\*Needles are sold separately

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Chem (1/4-28 UNF screw threads), gas tight, 8002-0405



Removable needle, gas tight, 8002-0401

## CrossLab Supplies for Dionex HPLC Systems

## Autosampler Supplies

Model	Material	OD (mm)	ID (mm)	Length (mm)	Volume (µL)	Fittings	Similar to OEM Part No.	Part No.
<b>Needle Seat Capillaries, 1/pk</b>								
WPS-3000SL	Stainless steel	0.8	0.12	120	1.35	With fittings, non pre-swaged	6820.2407	8002-0808
WPS-3000SL	Stainless steel	0.8	0.18	120	3.1	With fittings, non pre-swaged	6820.2408	8002-0809
WPS-3000SL Semiprep	Stainless steel	0.8	0.5	120	24	With fittings, non pre-swaged	6820.2409	8002-0810

## Pump Supplies

Model	Description	Unit	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Pistons and Seals</b>				
ISO-3100A	Piston, sapphire	1/pk	6035.2240	8002-0515
LPG-3400A				
LPG-3400AB				
LPG-3400M				
LPG-3400MB				
DGP-3600A				
DGP-3600AB				
DGP-3600M				
DGP-3600MB				
HPG-3x00A				
HPG-3x00M				
ISO-3100SD	Piston seal, reversed-phase	2/pk	6040.0304	8002-0502
LPG-3400SD				
LPG-3400RS				
DGP-3400SD				
DGP-3600RS				
HPG-3x00SD				
HPG-3x00RS				
HPG-3x00RS				
ISO-3100SD	Support ring for pistons seals	2/pk	6040.0012	8002-0501
LPG-3400SD				
LPG-3400RS				
DGP-3400SD				
DGP-3600RS				
HPG-3x00SD				
HPG-3x00RS				
HPG-3x00RS				
UltiMate 3000 pump series	Ring seal, DR-8, PTFE	10/pk	2266.0082	8002-0601

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## CrossLab Supplies for Dionex HPLC Systems

### Pump Supplies

Model	Description	Unit	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Check Valves and Cartridges</b>				
UltiMate 3000 RS pumps, optional for SD and BM pumps	Check valve cartridge, ceramic	1/pk	6041.2301	8002-0517
ISO-3100A LPG-3400A LPG-3400M LPG-3400MB LPG-3400AB DGP-3600A DGP-3600M DGP-3600MB DGP-3600AB HPG-3x00A HPG-3x00M HPG-3200P	Check valve cartridge, sapphire, biocompatible	1/pk	6035.2300	8002-0516

### Valve Replacement Parts

Model	Description	Unit	Similar to OEM Part No.	Agilent CrossLab Part No.
FLM-3x00	Rotor seal, proprietary inert polymer composite, 2-position 10-port C2 switching valve (standard)	1/pk	6720.0110	8002-0607
FLM-3x00	Rotor seal, polyaryletherketone/PTFE composite, 2-position 10-port C2 switching valve (biocompatible)	1/pk	6720.0092	8002-0605
FLM-3x00	Stator, stainless steel, 2-position 10-port C2 switching valve (standard)	1/pk	6720.0111	8002-0608
ASI-100	Tefzel rotor seal	1/pk	709.7010.071	8002-0604
ASI-100 Rheodyne injectors	Vespel rotor seal	1/pk	709.7010.039	8002-0602
ASI-100 Rheodyne injectors	Stainless steel stator	1/pk	709.7010.040	8002-0603

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Vespel rotor seal, 8002-0602



Stainless steel stator, 8002-0603

## CrossLab Supplies for Dionex HPLC Systems

### Sample Loops, 1/pk

Model	Description	Volume (µL)	Material	Similar to OEM Part No.	Agilent CrossLab Part No.
ASI-100 series	For 100 µL syringe	100	Stainless steel	5810.3012	8002-0859
ASI-100 ASI-100T	For 250 µL syringe	150	Stainless steel	5810.3003	8002-0856
ASI-100 series	For 1000 µL syringe	1000	Stainless steel	5810.3010	8002-0857
ASI-100P ASI-100PT	For 250 µL syringe	2500	Stainless steel	5810.3011	8002-0858

### Buffer Loops, 1/pk

Model	Volume (µL)	Material	Similar to OEM Part No.	Agilent CrossLab Part No.
WPS-3000SL Analytical WPS-3000RS	100	Stainless steel	6820.2413	8002-0860
WPS-3000SL Semiprep	>250	Stainless steel	6820.2421	8002-0811

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Looking for Performance Maintenance Kits for Rheodyne Valves?  
Please see pages 144-147.

## CrossLab Supplies for Dionex HPLC Systems

### Performance Maintenance Kits

Model	Description	Kit Contents	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Performance Maintenance Kits for Pumps</b>				
ISO-3100SD	Performance Maintenance Kit for ISO-3100SD pump	Contains 1 solvent line filter holder, 1 stainless steel solvent line filter frit (Porosity: 10 µm), 1 silicone tubing (2.80 mm od x 1.30 mm id x 1.5 m L), 1 PharMed tubing for peristaltic pump (3.2 mm od x 1.6 mm id x 180 mm L), 3 tube connectors for 1.0-2.0 mm id tubing, 4 piston seals (reversed-phase), 2 support rings, 1 PTFE O-ring seal (9 mm x 1.5 mm) for seal wash system, 1 PTFE O-ring seal (32 mm x 1.5 mm) for seal wash system, 1 check valve cartridge (sapphire), 1 cap seal for purge valve knob	6040.1950	8002-0907
ISO-3100BM	Performance Maintenance Kit for ISO-3100BM pump	Contains 1 solvent line filter holder, 1 PEEK solvent line filter frit (Porosity: 10 µm), 1 silicone tubing (2.80 mm od x 1.30 mm id x 1.5 m L), 1 PharMed tubing for peristaltic pump (3.2 mm od x 1.6 mm id x 180 mm L), 3 tube connectors for 1.0-2.0 mm id tubing, 4 piston seals (reversed-phase, biocompatible), 2 support rings, 1 PTFE O-ring seal (9 mm x 1.5 mm) for seal wash system, 1 PTFE O-ring seal (32 mm x 1.5 mm) for seal wash system, 1 check valve cartridge (sapphire), 1 cap seal for purge valve knob	6042.1950	8002-0917
LPG-3400SD	Performance Maintenance Kit for LPG-3400SD pump	Contains 4 solvent line filter holders, 4 stainless steel solvent line filter frits (Porosity: 10 µm), 1 silicone tubing (2.80 mm od x 1.30 mm id x 1.5 m L), 1 PharMed tubing for peristaltic pump (3.2 mm od x 1.6 mm id x 180 mm L), 3 tube connectors for 1.0-2.0 mm id tubing, 4 piston seals (reversed-phase), 2 support rings, 1 PTFE O-ring seal (9 mm x 1.5 mm) for seal wash system, 1 PTFE O-ring seal (32 mm x 1.5 mm) for seal wash system, 1 check valve cartridge (sapphire), 1 cap seal for purge valve knob	6040.1951	8002-0908
LPG-3400RS	Performance Maintenance Kit for LPG-3400RS pump	Contains 4 solvent line filter holders, 4 stainless steel solvent line filter frits (Porosity: 10 µm), 1 silicone tubing (2.80 mm od x 1.30 mm id x 1.5 m L), 1 PharMed tubing for peristaltic pump (3.2 mm od x 1.6 mm id x 180 mm L), 3 tube connectors for 1.0-2.0 mm id tubing, 4 piston seals (reversed-phase), 1 PTFE O-ring seal (9 mm x 1.5 mm) for seal wash system, 1 PTFE O-ring seal (32 mm x 1.5 mm) for seal wash system, 1 check valve cartridge (ceramic), 1 cap seal for purge valve knob	6040.1954	8002-0911

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(Continued)

## CrossLab Supplies for Dionex HPLC Systems

## Performance Maintenance Kits

Model	Description	Kit Contents	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Performance Maintenance Kits for Pumps</b>				
LPG-3400BM	Performance Maintenance Kit for LPG-3400BM pump	Contains 4 solvent line filter holders, 4 PEEK solvent line filter frits (Porosity: 10 µm), 1 silicone tubing (2.80 mm od x 1.30 mm id x 1.5 m L), 1 PharMed tubing for peristaltic pump (3.2 mm od x 1.6 mm id x 180 mm L), 3 tube connectors for 1.0-2.0 mm id tubing, 4 piston seals (reversed-phase, biocompatible), 2 support rings, 1 PTFE O-ring seal (9 mm x 1.5 mm) for seal wash system, 1 PTFE O-ring seal (32 mm x 1.5 mm) for seal wash system, 1 titanium inline filter frit (Porosity: 2 µm), 1 check valve cartridge (sapphire), 1 cap seal for purge valve knob	6042.1951	8002-0918
DGP-3600SD	Performance Maintenance Kit for DGP-3600SD pump	Contains 6 solvent line filter holders, 6 stainless steel solvent line filter frits (Porosity: 10 µm), 1 silicone tubing (2.80 mm od x 1.30 mm id x 1.5 m L), 1 PharMed tubing for peristaltic pump (3.2 mm od x 1.6 mm id x 180 mm L), 5 tube connectors for 1.0-2.0 mm id tubing, 8 piston seals (reversed-phase), 4 support rings, 2 PTFE O-ring seals (9 mm x 1.5 mm) for seal wash system, 2 PTFE O-ring seals (32 mm x 1.5 mm) for seal wash system, 2 check valve cartridges (sapphire), 2 cap seals for purge valve knob	6040.1952	8002-0909
DGP-3600RS	Performance Maintenance Kit for DGP-3600RS pump	Contains 6 solvent line filter holders, 6 stainless steel solvent line filter frits (Porosity: 10 µm), 1 silicone tubing (2.80 mm od x 1.30 mm id x 1.5 m L), 1 PharMed tubing for peristaltic pump (3.2 mm od x 1.6 mm id x 180 mm L), 5 tube connectors for 1.0-2.0 mm id tubing, 8 piston seals (reversed-phase), 2 PTFE O-ring seals (9 mm x 1.5 mm) for seal wash system, 2 PTFE O-ring seals (32 mm x 1.5 mm) for seal wash system, 2 check valve cartridges (ceramic), 2 cap seals for purge valve knob	6040.1955	8002-0912
DGP-3600BM	Performance Maintenance Kit for DGP-3600BM pump	Contains 6 solvent line filter holders, 6 PEEK solvent line filter frits (Porosity: 10 µm), 1 silicone tubing (2.80 mm od x 1.3 mm id x 1.5 m L), 1 PharMed tubing for peristaltic pump (3.2 mm od x 1.6 mm id x 180 mm L), 5 tube connectors for 1.0-2.0 mm id tubing, 8 piston seals (reversed-phase, biocompatible), 4 support rings, 2 PTFE O-ring seals (9 mm x 1.5 mm) for seal wash system, 2 PTFE O-ring seals (32 mm x 1.5 mm) for seal wash system, 2 titanium inline filter frits (Porosity: 2 µm), 2 check valve cartridges (sapphire), 2 cap seals for purge valve knob	6042.1952	8002-0919
HPG-3x00SD	Performance Maintenance Kit for HPG-3x00SD pump	Contains 4 solvent line filter holders, 4 stainless steel solvent line filter frits (Porosity: 10 µm), 1 silicone tubing (2.80 mm od x 1.30 mm id x 1.5 m L), 1 PharMed tubing for peristaltic pump (3.2 mm od x 1.6 mm id x 180 mm L), 5 tube connectors for 1.0-2.0 mm id tubing, 8 piston seals (reversed-phase), 4 support rings, 2 PTFE O-ring seals (9 mm x 1.5 mm) for seal wash system, 2 PTFE O-ring seals (32 mm x 1.5 mm) for seal wash system, 2 check valve cartridges (sapphire), 1 cap seal for purge valve knob	6040.1953	8002-0910

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(Continued)

## CrossLab Supplies for Dionex HPLC Systems

### Performance Maintenance Kits

Model	Description	Kit Contents	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Performance Maintenance Kits for Pumps</b>				
HPG-3x00RS	Performance Maintenance Kit for HPG-3x00RS pump	Contains 4 solvent line filter holders, 4 stainless steel solvent line filter frits (Porosity: 10 µm), 1 silicone tubing (2.80 mm od x 1.30 mm id x 1.5 m L), 1 PharMed tubing for peristaltic pump (3.2 mm od x 1.6 mm id x 180 mm L), 5 tube connectors for 1.0-2.0 mm id tubing, 8 piston seals (reversed-phase), 2 PTFE O-ring seals (9 mm x 1.5 mm) for seal wash system, 2 PTFE O-ring seals (32 mm x 1.5 mm) for seal wash system, 2 check valve cartridges (ceramic), 1 cap seal for purge valve knob	6040.1956	8002-0913
ISO-3100A LPG-3400A and M DGP-3600A and M HPG-3x00 A and M	Performance Maintenance Kit for UltiMate 3000 pumps with floating pistons	Contains 2 solvent line filter holders, 1 stirrer, 1 ECTFE tubing (1.60 mm od x 0.75 mm id x 1 m L), 1 silicone tubing (2.80 mm od x 1.30 mm id x 1.5 m L), 1 PharMed tubing for peristaltic pump (3.2 mm od x 1.6 mm id x 180 mm L), 2 fittings (for 1/8 in od tubing, PEEK), 2 solvent line locking rings (PEEK), 2 solvent line support flanges (PEEK), 2 knurled head screws (1/4 in-28 for ferrule 1/16 in, PEEK), 1 tube connector for 1.0-2.0 mm id tubing, 2 ferrules (1/16 in for 1/4 in-28 head screw, PEEK), 4 ring seals (DR-8), 8 piston seals (reversed-phase), 2 mixing chamber gaskets, 4 O-rings (22 mm x 2 mm, silicone), 4 pistons (sapphire), 4 inline filter frits (stainless steel; porosity: 0.5 µm), 4 inline filter frits (stainless steel; porosity: 10 µm), 8 solvent line filter frits (stainless steel; porosity: 10 µm), 2 piston support hemispheres, 4 support rings, 2 micro flow ring seals, and 4 check valve cartridges (sapphire)	6035.1961	8002-0904
LPG-3400AB and MB DGP-3600AB and MB	Performance Maintenance Kit for UltiMate 3000 pumps with floating pistons, Biocompatible	Contains 1 ECTFE tubing (1.6 mm od x 0.75 mm id x 1 m L), 1 silicone tubing (2.80 mm od x 1.30 mm id x 1.5 m L), 1 PharMed tubing for peristaltic pump (3.2 mm od x 1.6 mm id x 180 mm L), 2 PEEK fittings for 1/8 in od tubing, 2 solvent line locking rings (PEEK), 2 solvent line support flanges (PEEK), 2 knurled head screws (1/4 in-28 for ferrule 1/16 in, PEEK), 1 tube connector for 1.0-2.0 mm id tubing, 2 ferrules (1/16 in for 1/4 in-28 head screw, PEEK), 4 ring seals (DR-8), 8 piston seals (reversed-phase), 4 O-rings (22 mm x 2 mm, silicone), 4 pistons (sapphire), 4 inline filter frits (titanium; Porosity: 10 µm), 4 inline filter frits (PEEK; Porosity: 0.5 µm), 2 solvent line filter holders, 6 solvent line filter frits (titanium; Porosity: 10 µm), 2 piston support hemispheres, 4 support rings, 2 micro flow ring seals, 4 check valve cartridges (sapphire), and 2 mixing chamber gaskets	6035.1963	8002-0906

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

(Continued)

## CrossLab Supplies for Dionex HPLC Systems

## Performance Maintenance Kits

Model	Description	Kit Contents	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Performance Maintenance Kits for Pumps</b>				
HPG-3200P	Performance Maintenance Kit for HPG-3200P pump	Contains 1 stirrer, 1 silicone tubing (2.80 mm od x 1.30 mm id x 1.5 m L), 1 PharMed tubing for peristaltic pump (3.2 mm od x 1.6 mm id x 180 mm L), 1 FEP tubing (4.5 mm od x 3.0 mm id x 2 m L), 1 tube connector for 1.0-2.0 mm id tubing, 2 tube adaptors (3.0 mm id 1/4 in-28), 4 ring seals (DR-8), 8 piston seals (reversed-phase, semipreparative), 2 mixing chamber gaskets, 4 ceramic pistons (semipreparative), 4 stainless steel inline filter frits (Porosity: 10 µm), 2 stainless steel solvent line filters (Porosity: 10 µm), 4 support rings (semipreparative), 4 check valve cartridges (sapphire)	6035.1962	8002-0905
ISO-3100A LPG-3400 A and M DGP-3600 A and M HPG-3x00 A and M	Piston seal/support ring kit, reversed-phase	Contains 1 support ring and 2 piston seals	6025.2010A	8002-0923
LPG-3400AB LPG-3400MB DGP-3600AB DGP-3600MB ISO-3100BM LPG-3400BM DPG-3600BM	Piston seal/support ring kit, reversed-phase, biocompatible	Contains 1 support ring and 2 piston seals	6025.2012	8002-0901
HPG-3200P P680	Piston seal/support ring kit, reversed-phase, semipreparative	Contains 1 support ring and 2 piston seals	6030.9010	8002-0902
HPG-3200P P680	Piston seal/support ring kit, normal phase, semipreparative	Contains 1 support ring and 2 piston seals	6030.9011	8002-0903
ISO-3100A LPG-3400A LPG-3400M DGP-3600A DGP-3600M HPG-3x00A HPG-3x00M ISO-3100SD LPG-3400SD DGP-3600SD HPG-3x00SD	Piston seal/support ring kit, normal phase	Contains 1 support ring and 2 piston seals	6025.2011A	8002-0924

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

(Continued)

## CrossLab Supplies for Dionex HPLC Systems

### Performance Maintenance Kits

Model	Description	Kit Contents	Similar to OEM Part No.	Agilent CrossLab Part No.
<b>Performance Maintenance Kits for Pumps</b>				
ISO-3100SD ISO-3100BM LPG-3400SD LPG-3400BM LPG-3400RS DGP-3600SD DGP-3600BM DGP-3600RS HPG-3x00SD HPG-3x00RS HPG-3200BX	PTFE seal kit for rear seal wash system	Contains 5 PTFE O-ring seals 9 mm x 1.5 mm, 5 PTFE O-ring seals 32 mm x 1.5 mm	6040.2208	8002-0915
ISO-3100SD ISO-3100BM LGP-3400SD LGP-3400RS LGP-3400BM DGP-3600SD DGP-3600RS DGP-3600BM HPG-3x00SD HPG-3x00RS	Tubing Kit for Rear Seal Wash System	Contains 1 silicone tubing (2.80 mm od x 1.30 mm id x 1.5 m L), 1 PharMed tubing for peristaltic pump (3.2 mm od x 1.6 mm id x 180 mm L), 7 tube connectors for 1.0-2.0 mm id tubing	6040.9502	8002-0916
<b>Performance Maintenance Kits for Autosamplers</b>				
WPS-3000TBSL Autosampler	Rotor Seal and Stator Face Seal Kit	Contains 1 rotor seal and 1 stator face	6722.9014	8002-0611
WPS-3000SL WPS-3000RS	Rotor Seal Kit	Contains 2 PEEK rotor seals, 1 9/64 in hex key, instructions	6840.0012	8002-0610

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

## CrossLab Supplies for Dionex HPLC Systems

## HPLC Capillaries, 1/pk

Model	From	To	Material	OD (mm)	ID (mm)	Length (mm)	Fittings	Similar to OEM Part No.	Agilent CrossLab Part No.
UltiMate 3000 RS	Pump	Autosampler	Flexible stainless steel	0.6	0.13	450	With fittings, non pre-swaged	6040.2345	8002-0822
UltiMate 3000 SD	Pump	Autosampler	Flexible stainless steel	0.6	0.18	450	With fittings, non pre-swaged	6040.2365	8002-0824
UltiMate 3000 RS	Autosampler	Column Thermostat Valve	Flexible stainless steel	0.6	0.13	350	With fittings, non pre-swaged	6040.2335	8002-0821
UltiMate 3000 SD	Autosampler	Column Thermostat Valve	Flexible stainless steel	0.6	0.18	350	With fittings, non pre-swaged	6040.2375	8002-0825
UltiMate 3000	Autosampler	Column Thermostat Valve	Stainless steel	1.6	0.23	340	With fittings, non pre-swaged	6820.2418	8002-0837
UltiMate 3000 RS	Column Thermostat Valve	Column	Flexible stainless steel	0.6	0.13	550	With fittings, non pre-swaged	6040.2305	8002-0818
UltiMate 3000 RS	Pump	Autosampler	Flexible stainless steel	0.6	0.18	550	With fittings, non pre-swaged	6040.2355	8002-0823
UltiMate 3000 SD	Column Thermostat Valve	Column							
UltiMate 3000 RS	Column	Detector	Flexible stainless steel	0.6	0.13	250	With fittings, non pre-swaged	6040.2325	8002-0820
UltiMate 3000 SD	Column	Detector	Flexible stainless steel	0.6	0.18	250	With fittings, non pre-swaged	6040.2385	8002-0826
UltiMate 3000	Column	Detector	Stainless steel	1.6	0.13	250	With fittings, non pre-swaged	6074.2410	8002-0833
UltiMate 3000	Column	Detector	PEEK	1.6	0.13	250	With fittings, non pre-swaged	6074.2415	8002-0834
UltiMate 3000	Column	Detector	Stainless steel	1.6	0.23	250	With fittings, non pre-swaged	6074.2400	8002-0831
UltiMate 3000	Column	Detector	PEEK	1.6	0.25	250	With fittings, non pre-swaged	6074.2405	8002-0832
UltiMate 3000 RS			Flexible stainless steel	0.6	0.13	150	With fittings, non pre-swaged	6040.2315	8002-0819

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

(Continued)

## CrossLab Supplies for Dionex HPLC Systems

### HPLC Capillaries, 1/pk

Model	From	To	Material	OD (mm)	ID (mm)	Length (mm)	Fittings	Similar to OEM Part No.	Agilent CrossLab Part No.
VWD-3100			PEEK	1.6	0.25	2000	No fittings	6251.6001	8002-0835
VWD-3100RS									
VWD-3400									
VWD-3400RS									
DAD-3000									
DAD-3000RS									
MWD-3000									
MWD-3000RS									
ISO-3100BM									
LPG-3400AB									
LPG-3400MB									
LPG-3400BM									
DPG-3600AB									
DPG-3600MB									
DPG-3600BM									
Summit P680	Pump	Autosampler	Stainless steel	1.6	0.508	178	With fittings, non pre-swaged	5030.3020	8002-0816
Summit ASI-100	Autosampler	Column	Stainless steel				With fittings, non pre-swaged	6000.0020	8002-0817*
UVD 170U	Column	Detector	PEEK	1.6	0.5	1000	No fittings	2251.6002	8002-0815
UVD 340U									

\*CrossLab capillary and fitting kit, for ASI-100 Autosampler, contains 1 stainless steel capillary (0.7 mm id x 1 m), 2 stainless steel capillaries (0.25 mm id x 2 m), 15 10-32UNF stainless steel fittings, 5 10-32UNF stainless steel long fittings, 3 10-32UNF stainless steel extra long fittings, 15 stainless steel ferrules 1/16 in, and 8 stainless steel long ferrules 1/16 in

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

## CrossLab Supplies for Dionex HPLC Systems

## Tubing

Model	Description	OD (mm)	ID (mm)	Length (mm)	Fittings	Similar to OEM Part No.	Agilent CrossLab Part No.
LPG-3x00 peristaltic pump	PharMed biocompatible tubing	3.2	1.6	180	No fittings	6000.5000	8002-0803

## HPLC Fittings, Ferrules, and Unions

Model	Description	Unit	Similar to OEM Part No.	Agilent CrossLab Part No.
UltiMate 3000 Series	Blind nut, FS-8 biocompatible	1/pk	6000.0144 6000.0044	8002-0802
WPS-3000(T)SL WPS-3000(T)SL Semiprep WPS-3000(T)RS	Ferrule and fitting kit, contains 6 ferrules and 6 long fitting screws		6822.0011	8002-0921

## HPLC In-Line Filters

Model	Description	Unit	Similar to OEM Part No.	Agilent CrossLab Part No.
LPG-3400BM DGP-3600BM	In-line filter, 10 µL	1/pk	6042.5014	8002-0805
LPG-3400BM DGP-3600BM	Filter frit for titanium in-line filter, 2 µL	1/pk	6268.0036	8002-0806

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

Please visit [www.agilent.com/chem/CrossLabHPLC](http://www.agilent.com/chem/CrossLabHPLC) for up-to-date info for the growing portfolio of CrossLab LC Supplies for your non-Agilent HPLC systems.



For Agilent CrossLab Vials and Closures ordering information please see the General Chromatography catalog (publication # 5991-1059EN) [www.agilent.com/chem/library](http://www.agilent.com/chem/library)

For Agilent CrossLab Well Plates and Sealing Mats ordering information please see the General Chromatography catalog (publication # 5991-1059EN) [www.agilent.com/chem/library](http://www.agilent.com/chem/library)



# CrossLab Supplies for CTC Analytics HPLC Autosamplers

Agilent's CrossLab portfolio includes a variety of syringes compatible with CTC Analytics HPLC HTS and HTC PAL systems.

## Autosampler Syringes for CTC HTS and HTC PAL, 1/pk

Volume (µL)	Description	Needle Gauge/Length (mm)/Tip	Agilent CrossLab Syringe	Agilent CrossLab Replacement Plunger
10	Fixed needle	22s/51/3	8010-0440*	
	Fixed needle, gas tight	22s/51/3	8010-0445*	8010-0457, 10/pk
25	Fixed needle, gas tight	22s/51/3	8010-0441	8010-0458, 10/pk
	Fixed needle, gas tight	22s/51/3	8010-0449*	8010-0450, 10/pk
100	Fixed needle, gas tight	22s/51/3	8010-0442*	8010-0459, 10/pk
	Fixed needle, gas tight	22/51/3	8010-0446*	8010-0459, 10/pk
250	Fixed needle, gas tight	22/51/3	8010-0467	8010-0456, 10/pk
500	Fixed needle, gas tight	22/51/3	8010-0468	8010-0460, 10/pk
1.0 mL	Fixed needle, gas tight	22/51/3	8010-0443	8010-0455, 1/pk
2.5 mL	Fixed needle, gas tight	22/51/3	8010-0444	8010-0448, 1/pk

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

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



# CE and CE/MS

## CE Solutions Kits

Agilent continues to introduce new CE solutions kits designed to simplify many of your applications:

- Inorganic anions
- Cations
- Organic acids
- Forensic anions
- $\mu$ Page

These kits include all you need to begin your CE analyses, including buffers, capillaries, conditioning solutions, test samples, methods and detailed descriptions. Each kit is designed to take advantage of the automation of the Agilent CE system to make your time in the laboratory more efficient. All kits are prepared using the same quality procedures as our buffers and are thoroughly tested and supported.

While the kits have been optimized for use with the Agilent CE system, they may be used with virtually any commercial or home-built CE system.

## Inorganic Anion Solutions Kit

The Inorganic Anion Solutions Kit contains all components needed for the analysis of common inorganic anions such as chloride, bromide, iodide, fluoride, sulfate, and phosphate. Applications include the analysis of inorganic ions in:

- Ultra pure water
- Waste water
- High purity chemicals
- Drug formulations
- Pulp and paper solutions
- Semiconductor solutions

Using an indirect UV detection system optimized for small anions, analyses are sensitive and rapid, and provide an alternative to traditional ion chromatography. The kit contains buffer, capillaries, test mixture, and instructions.



Inorganic anion solutions kit, 5063-6511



Inorganic anion solutions kit, 5063-6511



Ultra pure CE water, 5062-8578



0.1 N sodium hydroxide, 5062-8575

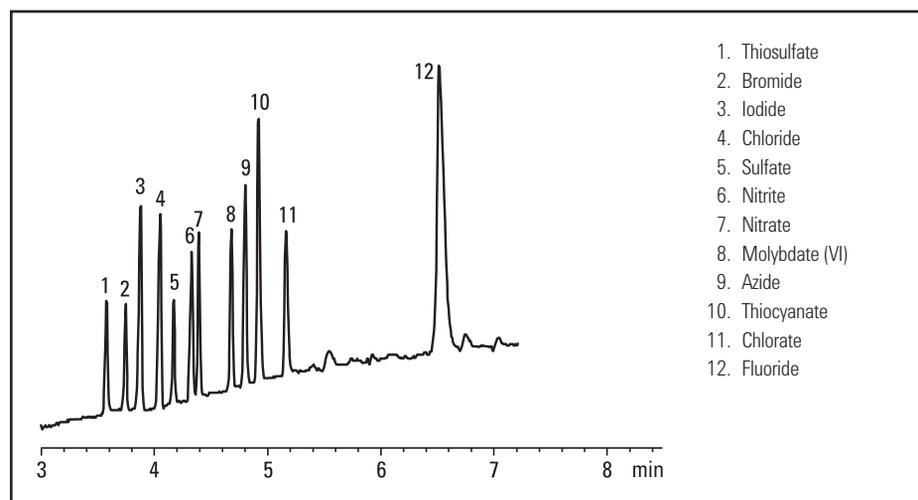


Inorganic anion test mixture, 5062-8524

### Inorganic Anion Solutions Kit

Description	Unit	Part No.
Inorganic Anion Solutions Kit		5063-6511
Inorganic anion buffer	250 mL	8500-6797
Ultra pure CE water	500 mL	5062-8578
0.1 N sodium hydroxide	250 mL	5062-8575
1.0 N sodium hydroxide	250 mL	5062-8576
Bare fused-silica capillary, 50 µm id, 72 cm long	2/pk	G1600-62211
Inorganic anion test mixture	10 mL	5062-8524
Includes 1000 ppm each of fluoride, chloride, bromide, nitrite, sulfate and 2000 ppm phosphate		

**Note:** The following part should be ordered separately for use with the Agilent CE System:  
 Alignment interface for standard 50 µm id capillary (P/N G1600-60210) for 1600 HP<sup>3</sup>D CE  
 Alignment interface for standard 50 µm id capillary (P/N G7100-60210) for 7100 CE



Separation of common anions

## Cation Solutions Kit

The Cation Solutions Kit provides everything you need for the analysis of inorganic and low-molecular-mass organic cations. It is specially designed for the separation of alkali metal ions, alkaline-earth metal ions and alkyl amines in a wide range of matrices.

Each kit contains a cation buffer, bare fused silica capillaries, cation standard, CE grade water and a detailed description of the analysis method and most common applications, including detection limits and reproducibility data. The Cation Solutions Kit and the separation methods were developed to fit perfectly with the Agilent CE system and to support its high automation capabilities. The methods are very easy to perform and provide accurate and quantitative analyses.

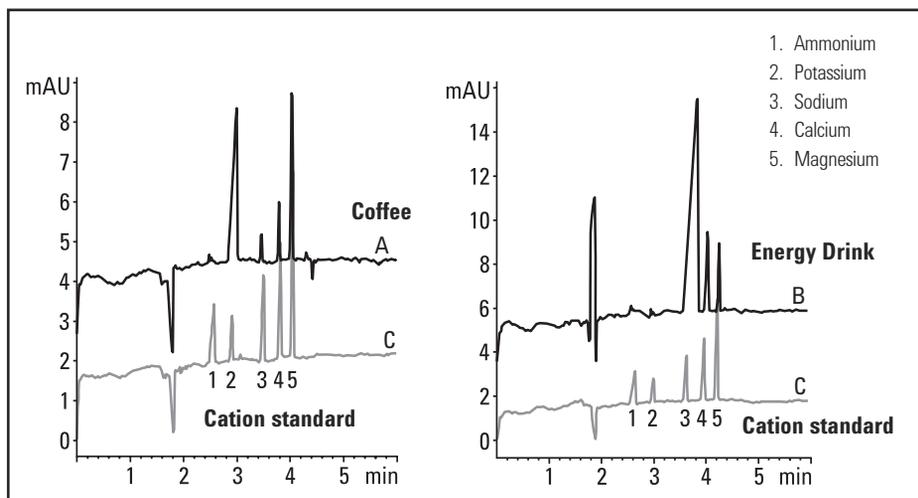
### Cation Solutions Kit

Column Description	Unit	Part No.
Cation Solutions Kit		5064-8206
Cation buffer	250 mL	5064-8203
Ultra pure CE water	500 mL	5062-8578
Bare fused silica capillary, extended light path bubble factor (3), 50 µm id, 56 cm long	2/pk	G1600-61232
Cation test mixture	25 mL	5064-8205

**Note:** The following part should be ordered separately for use with the Agilent CE System:

Alignment interface for 50 µm id extended light path capillary (P/N G1600-60230) for 1600 HP<sup>3</sup>D CE

Alignment interface for 50 µm id extended light path capillary (P/N G7100-60230) for 7100 CE



Cations in coffee and energy drinks

## Organic Acids Solutions Kit

The Organic Acids Solutions Kit is ideal for the analysis of short alkyl chain carboxylic acids. Employing an indirect UV detection agent optimized for organic acids, the methodology is simple, sensitive, and provides accurate quantitative analysis. Suited for the analysis of organic acids in a wide range of matrices, it is especially useful for determination of organic acids in beverages and food.

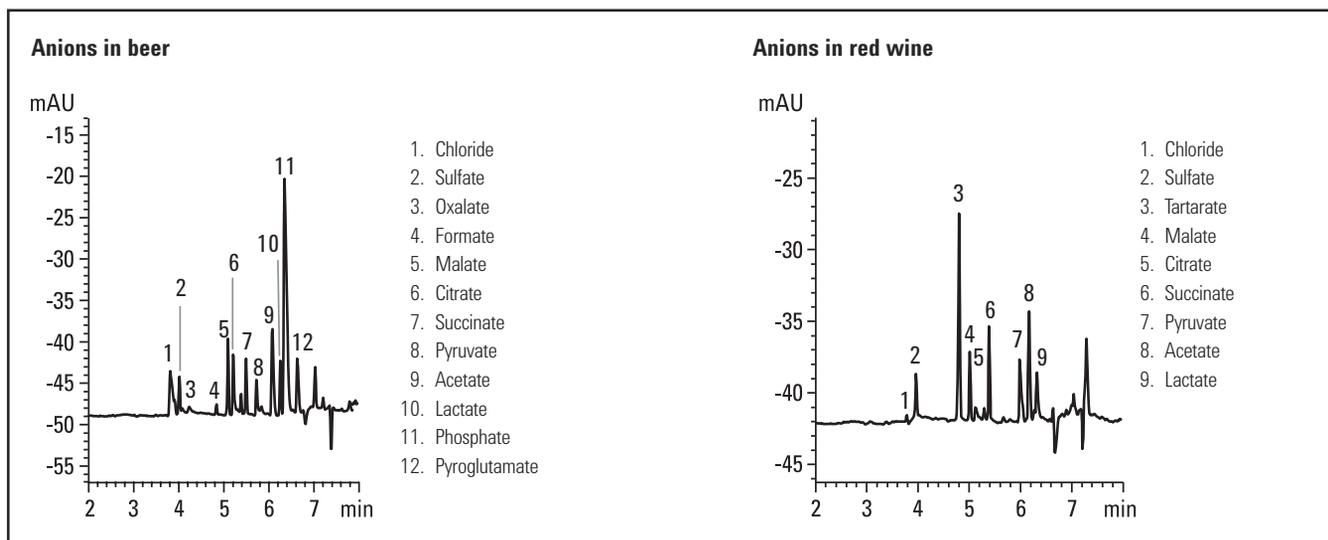
### Organic Acids Solutions Kit

Description	Unit	Part No.
Organic Acids Solutions Kit		5063-6510
Organic acids buffer	250 mL	8500-6785
Ultra pure CE water	500 mL	5062-8578
1.0 N sodium hydroxide	250 mL	5062-8576
Bare fused-silica capillary, 75 µm id, 72 cm long	2/pkg	G1600-62311
Organic acids test mixture	20 mL	8500-6900
Includes 1000 ppm each of malate, succinate, and lactate		

Note: The following part should be ordered separately for use with the Agilent CE System:

Alignment interface for 75 µm id capillary (P/N G1600-60310) for 1600 HP<sup>3</sup>D CE

Alignment interface for 75 µm id capillary (P/N G7100-60310) for 7100 CE



Organic acids in beer and red wine

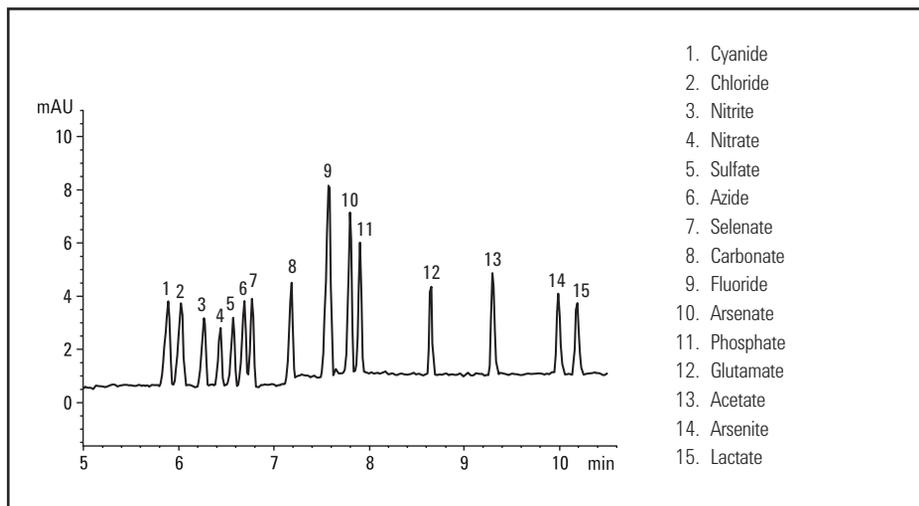
## Forensic Anions Solutions Kit

This highly focused kit was developed specifically for the analysis of poisonous compounds, such as cyanide, azide, selenate, arsenate, and arsenite. In cases of poisoning, analytical tools are needed to determine the identity of toxins quickly and accurately. A rapid determination of anionic toxins in adulterated foods and beverages is possible using CE with indirect UV detection. Forensic and other anions can be detected within 15 minutes with minimal sample preparation.

### Forensic Anions Solutions Kit

Description	Unit	Part No.
Forensic Anions Solutions Kit	5 x 50 mL	5064-8208
Basic anion buffer	50 mL	5064-8209
Ultra pure CE water	500 mL	5062-8578
Bare fused-silica capillary, 50 µm id, 104 cm long	2/pk	G1600-64211
Inorganic anion test mixture Includes 1000 ppm each of fluoride, chloride, bromide, nitrite, sulfate and 2000 ppm phosphate	10 mL	5062-8524

**Note:** The following part should be ordered separately for use with the Agilent CE System:  
Alignment interface for standard 50 µm id capillary (P/N G1600-60210) for 1600 HP<sup>3</sup>D CE  
Alignment interface for standard 50 µm id capillary (P/N G7100-60210) for 7100 CE



Analysis of an anion standard with the Forensic Anions Solutions Kit

## μPAGE Solution Kits

μPAGE poly-acrylamide gel-filled capillaries are the most direct vehicles to transfer all of your applications from slab gel to CE, utilizing the automation, high speed, high resolution, and quantitative advantages of CE. The capillaries are ideal for high resolution separations of oligonucleotides, single-stranded and double-stranded DNA fragments, polymerase chain reaction (PCR) products, sequencing reaction products and oligosaccharides.

μPAGE capillaries are available in three different pore sizes. The size of the molecular sieving pores is controlled by the monomer concentration (%T) and the degree of polymer cross-linking (%C). Gels with higher %T and %C values have smaller pores and are, therefore, more effective at resolving smaller molecules. μPAGE-10 (10%T, 0%C) capillaries provide high resolution capabilities for separation of antisense therapeutic agents, primers and probes, as well as nucleotides.

μPAGE-5 (5%T, 5%C) allows single base resolution of oligonucleotides [pd(A)] ranging from 20 to 150 bases.

For your convenience, μPAGE capillaries and μPAGE buffers can be purchased together or separately. To achieve the highest reproducibility and provide optimal longevity, use μPAGE buffer with μPAGE capillaries.

### μPAGE Starter Kits

Includes 3 μPAGE capillaries, 75 cm total length, 50 cm effective length, oligonucleotide standard and μPAGE buffer

Kit as defined by type of μPAGE capillary	ID (μm)	Part No.
μPAGE-10 (10%T, 0%C) μPAGE pd(A) <sub>25-30</sub> oligonucleotide standard for μPAGE-10 kit μPAGE buffer, 2 x 237 mL	100	192-1311
μPAGE-5 (5%T, 5%C) μPAGE pd(A) <sub>25-30, 40-60</sub> oligonucleotide standard for μPAGE-3 and μPAGE-5 kits μPAGE buffer, 2 x 237 mL	75	192-5211
μPAGE-3 (3%T, 3%C) μPAGE pd(A) <sub>25-30, 40-60</sub> oligonucleotide standard for μPAGE-3 and μPAGE-5 kits μPAGE buffer, 2 x 237 mL	75	192-3211

### μPAGE Basic Kits

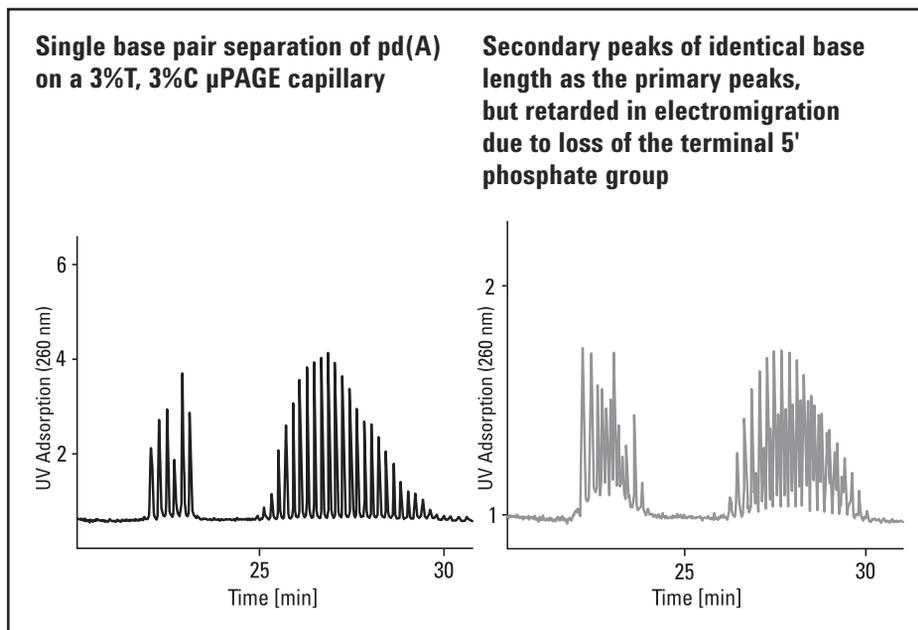
Includes 3 μPAGE capillaries, 75 cm total length, 50 cm effective length

Kit as defined by type of μPAGE capillary	ID (μm)	Part No.
μPAGE-10 (10%T, 0%C)	100	191-1311
μPAGE pd(A) <sub>25-30</sub> oligonucleotide standard for μPAGE-10 kit		
μPAGE-5 (5%T, 5%C)	75	191-5211
μPAGE pd(A) <sub>25-30, 40-60</sub> oligonucleotide standard for μPAGE-3 and μPAGE-5 kits		
μPAGE-3 (3%T, 3%C)	75	191-3211
μPAGE pd(A) <sub>25-30, 40-60</sub> oligonucleotide standard for μPAGE-3 and μPAGE-5 kits		

**Note:** The μPAGE capillaries are not pre-aligned for the G1600A CE and G7100 CE systems. To cut them to the correct length, use the CE column cutter (P/N 5183-4669). To create detection window, use the Window Etching Tool (P/N 590-3003).

### μPAGE Buffer Solutions and Oligo Standards

Kit as defined by type of μPAGE capillary	Part No.
μPAGE tris-borate and urea buffer for μPAGE-10, 4 x 237 mL	590-4005
μPAGE tris-borate and urea buffer for μPAGE-3 and μPAGE-5, 4 x 237 mL	590-4001
μPAGE pd(A) <sub>25-30, 40-60</sub> oligonucleotide standard for μPAGE-3 and μPAGE-5, 3 x 50 μL	590-4000

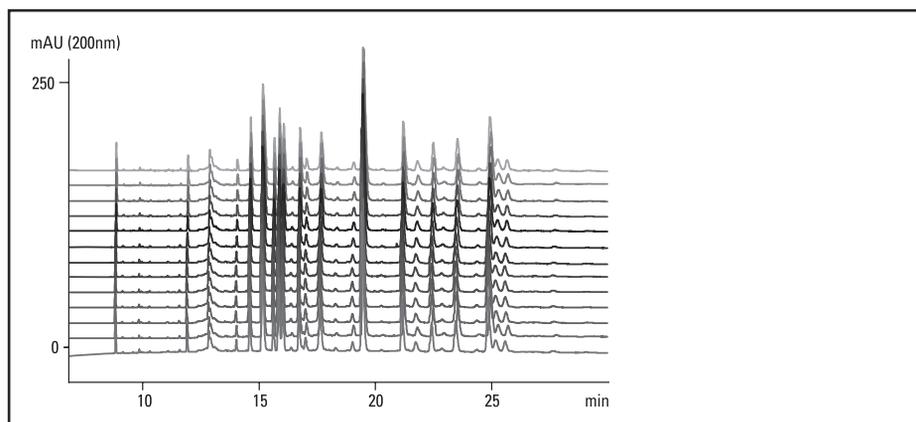


Oligonucleotide samples with or without terminal 5 phosphate group

## CE and CE/MS Capillaries

### Standard Bare Fused-Silica Capillaries

Fused-silica capillaries are the heart of CE. Pre-aligned capillaries from Agilent Technologies are designed and optimized for ease of use and reliability. All capillary ends are cut to a smooth, mirror-like finish. In addition, the polyimide outer coating is removed from the ends. These processes ensure minimal sample adsorption and help maintain sharp peak shapes. All capillaries have a pre-made detection "window" and a built-in alignment stopper that allows rapid and precise insertion in the alignment interface.



CZE of a tryptic digest of recombinant human growth hormone using a standard fused-silica capillary with 75  $\mu\text{m}$  internal diameter

#### Standard Bare Fused-Silica Capillaries, 2/pk

ID ( $\mu\text{m}$ )	Total Length (cm)	Effective Length (cm)	Color Code	Part No.
50	33	24.5	Green	G1600-63211
	48.5	40	Green	G1600-60211
	64.5	56	Green	G1600-61211
	80.5	72	Green	G1600-62211
	112.5	104	Green	G1600-64211
75	33	24.5	Blue	G1600-63311
	48.5	40	Blue	G1600-60311
	64.5	56	Blue	G1600-61311
	80.5	72	Blue	G1600-62311
	112.5	104	Blue	G1600-64311
100	33	24.5	Gray	G1600-63411
	48.5	40	Gray	G1600-60411
	64.5	56	Gray	G1600-61411
	80.5	72	Gray	G1600-62411
	112.5	104	Gray	G1600-64411

#### TIPS & TOOLS



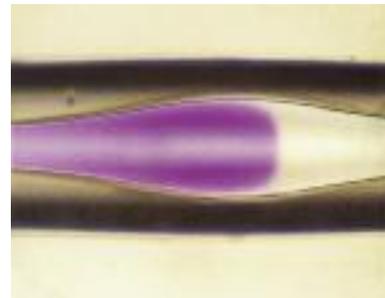
Different inner diameters of capillaries need to use different alignment interfaces to guarantee optimal detection. The color coding of the capillary and the alignment interface allow you to easily match the correct interface with the capillary.

## Extended Light Path (Bubble Cell) Bare Fused-Silica Capillaries

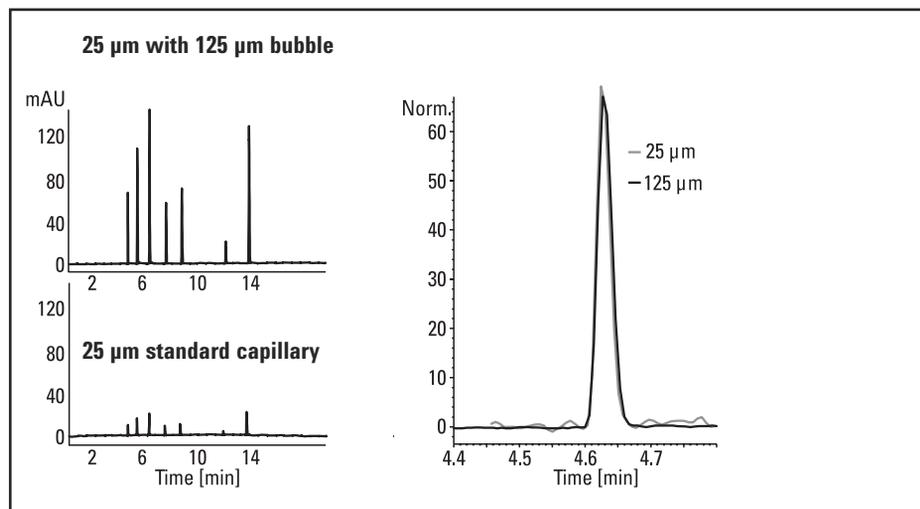
Use Agilent Technologies extended light path capillaries ("bubble" cell capillaries) to improve sensitivity 3- to 5-fold over standard capillaries. With extended light path capillaries, the inner diameter is increased only at the detection window, offering the sensitivity of a wide inner diameter capillary and the low current generation of a narrow one.

Resolution is not sacrificed when used with matching optical alignment interfaces from Agilent.

Through a computer-controlled proprietary process, the diameter is increased three to five times, with a manufacturing precision better than 3%. Take advantage of this process to extend the detection pathlength of 25  $\mu\text{m}$  id capillaries to 125  $\mu\text{m}$ , 50  $\mu\text{m}$  to 150  $\mu\text{m}$ , and 75  $\mu\text{m}$  to 200  $\mu\text{m}$ .



Electroosmotic flow maintains the "plug" flow in the bubble. Optical slits matched to the zone geometry maintain resolution.



Analysis of cold medicine ingredients in a standard capillary (25  $\mu\text{m}$  id) and an Agilent Extended Light Path Capillary

### TIPS & TOOLS

Use narrow 25 and 50  $\mu\text{m}$  id "bubble" cell capillaries for highly conductive buffers without sacrificing sensitivity.



**Extended Light Path (Bubble Cell) Bare Fused-Silica Capillaries, 2/pk**

<b>ID (μm)</b>	<b>Total Length (cm)</b>	<b>Effective Length (cm)</b>	<b>Bubble Factor</b>	<b>Optical Path Length (μm)</b>	<b>Color Code</b>	<b>Part No.</b>
25	48.5	40	5	125	Black	G1600-60132
	64.5	56	5	125	Black	G1600-61132
	80.5	72	5	125	Black	G1600-62132
50	43.5	35	3	150	Red	G1600-60233
	48.5	40	3	150	Red	G1600-60232
	64.5	56	3	150	Red	G1600-61232
	80.5	72	3	150	Red	G1600-62232
	112.5	104	3	150	Red	G1600-64232
75	48.5	40	2.7	200	Yellow	G1600-60332
	64.5	56	2.7	200	Yellow	G1600-61332
	80.5	72	2.7	200	Yellow	G1600-62332
	112.5	104	2.7	200	Yellow	G1600-64332

## Universal Bare Fused-Silica Capillaries

Universal Bare Fused-Silica Capillaries have a window, 75 cm effective length and 363  $\mu\text{m}$  od, fitting into any CE instrument. To cut them to the correct length we recommend using the CE column cutter (P/N 5183-4669).

### Universal Bare Fused-Silica Capillaries

ID ( $\mu\text{m}$ )	Total Length (cm)	Effective Length (cm)	Part No.
20	100	75	190-0431
50	100	75	190-0131
75	100	75	190-0231
100	100	75	190-0331

### Bulk Fused-Silica Capillaries

ID ( $\mu\text{m}$ )	Total Length (m)	Part No.
20	5	160-2660-5
50	5	160-2650-5
75	5	160-2644-5

## Polyvinyl Alcohol (PVA) Coated Capillaries

PVA coated capillaries contain a permanently adsorbed layer of polyvinyl alcohol. This coating minimizes hydrophobic and electrostatic solute/wall interactions and eliminates electroosmotic flow (EOF). Using a proprietary deposition process, the PVA coating is stable over a wide pH range, even under basic conditions, from pH 2.5 to 9.5. This stability allows the use of many common CE buffers. Because the silica surface is covered, many proteins and amines can be analyzed without the peak tailing found with uncoated capillaries. In addition, since EOF is eliminated, cumbersome washing procedures are unnecessary and migration time reproducibility may be improved.

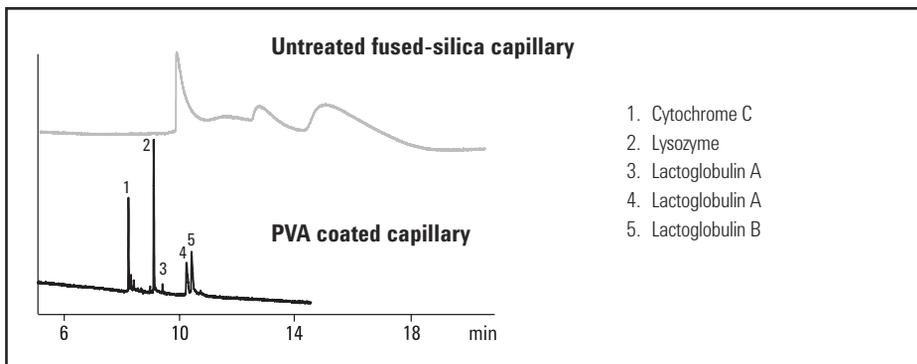
Each batch of PVA coated capillaries is rigorously tested by Agilent Technologies and includes a representative electropherogram to assure quality.

The color coding of the capillary (alignment stopper) and the alignment interfaces allow you to easily combine the correct interface with the capillary. Capillaries for non-Agilent CE systems have removable alignment stoppers without color code.

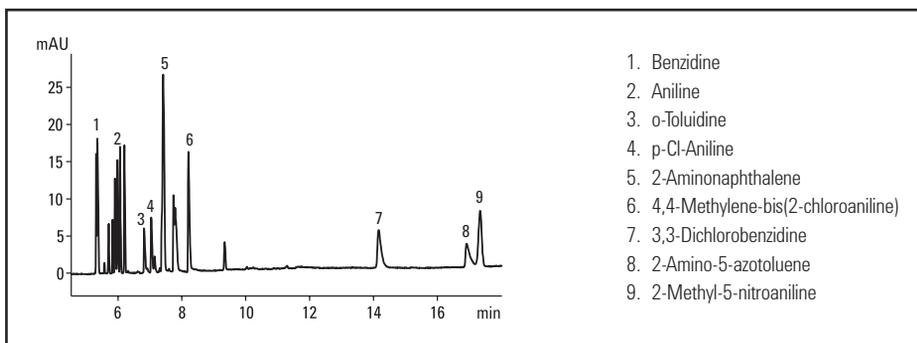
PVA coated capillaries can be used for a variety of applications, including protein analysis at physiological pH, isoelectric focusing, and small anion analysis without the need for flow-reversal agents in the buffer.

PVA coating is available in standard capillaries, or in Agilent Extended Light Path Capillaries ("bubble" cell capillaries) for high sensitivity applications. Both capillary types are available in longer lengths for use in non-Agilent systems.

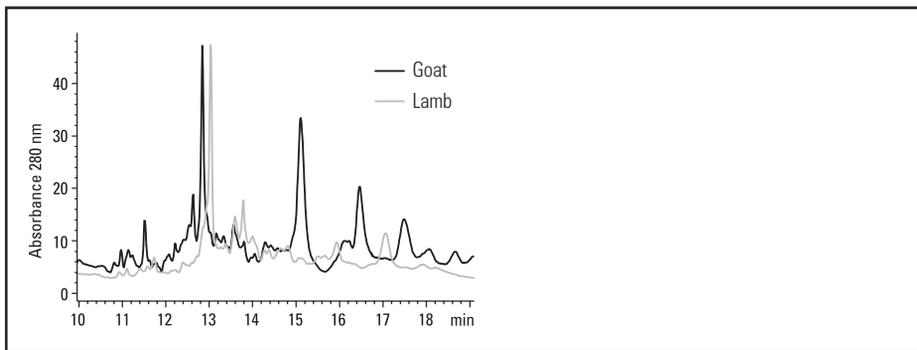
PVA is also available for use with the High Sensitivity Detection Cell for even further improved HPLC-like sensitivity. In addition, PVA coated capillaries are offered for CE-MS applications. The capillaries are provided with a normally positioned detection window to allow tandem UV-Vis and MS detection for improved sample identification.



Use of PVA coated capillaries to reduce protein adsorption



CZE analysis of basic amines using PVA coated capillaries (decomposition products of azo dyes)



Analysis of meat proteins by c-IEF using PVA capillaries

**PVA Coated Capillaries for Agilent CE Systems\***

ID (µm)	Total Length (cm)	Effective Length (cm)	Bubble Factor	Optical Path Length (µm)	Color Code	Part No.
50	64.5	56	0	50	Green	G1600-61219
	64.5	56	3	150	Red	G1600-61239
	125	21.5	0	50	Green	G1600-67219
75	64.5	56	0	1200		G1600-68319
	125	21.5	0	75	Blue	G1600-67319
100	48.5	40	0	100	Gray	G1600-60419
	64.5	56	0	100	Gray	G1600-61419

\*Not compatible with borate buffers

**Note:** PVA coated capillaries for CE/MS have a blue alignment stopper matching the blue color code of the alignment interface for MS-UV detection. The alignment stopper of the 50 µm id PVA capillary for CE/MS has a black dot for easy identification.

**PVA Coated Capillaries for Non-Agilent CE Systems\***

ID (µm)	Total Length (cm)	Effective Length (cm)	Bubble Factor	Optical Path Length (µm)	Part No.
50	71	60	0	50	G160U-61219
	71	60	3	150	G160U-61239
100	56	45	0	100	G160U-60419
	71	60	0	100	G160U-61419

\*Not compatible with borate buffers

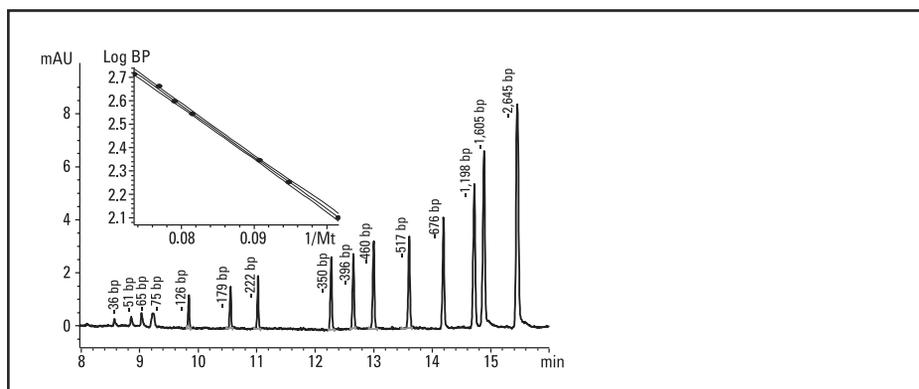
**Note:** When extended pathlength capillaries are used in non-Agilent systems, loss of resolution may be found if the axial slit width is not reduced. In Agilent systems, the alignment interface contains properly matched slits to maintain resolution.

## CEP Coated Capillaries

CEP coated capillaries contain a permanently bonded polymer coating. This CEP coating shields the silanol functionality of the capillary surface and helps prevent sample adsorption. Additionally, EOF is nearly eliminated, making the capillary ideal for applications such as DNA separations with sieving polymer buffers.

Elimination of EOF also simplifies analysis of anions and organic acids by direct UV detection. Without EOF reduction, highly mobile ions such as nitrate can migrate in the opposite direction to the slower, longer chain acids.

The CEP coated capillary is stable from pH 2 to 8. It can be used with borate buffers, offering a different surface functionality to help alleviate sample adsorption. Each batch of CEP coated capillaries is rigidly tested by Agilent Technologies and each capillary includes a representative electropherogram to assure quality.



Restriction fragment separation (36–2645 bp)

### CEP Coated Capillaries, 2/pk

ID (μm)	Total Length (cm)	Effective Length (cm)	Bubble Factor	Optical Path Length (μm)	Part No.
75	80.5	72	0	75	G1600-62318



## Cross-linked and Bonded $\mu$ SIL Capillaries

### $\mu$ SIL-FC and $\mu$ SIL-DNA Capillaries with Windows

A series of coated capillaries specifically designed for CE, which are prepared by cross-linking and bonding a novel, proprietary fluorocarbon (FC) polymer.  $\mu$ SIL-FC capillaries are chemically inert, hydrophobic, and stable from pH 2.5-10.

These capillaries are a must-have for cIEF, protein, peptide and carbohydrate separations, as well as replaceable gel CE applications such as oligonucleotides, DNA fragments, and PCR product separations.

$\mu$ SIL-DNA capillaries are also coated with an FC polymer but have a 75  $\mu$ m id to accommodate the viscosity of entangled polymer solutions. All  $\mu$ SIL capillaries are batch tested to ensure the highest performance and reproducibility.



$\mu$ SIL-DNA, 199-2602

### $\mu$ SIL-WAX Capillaries with Windows

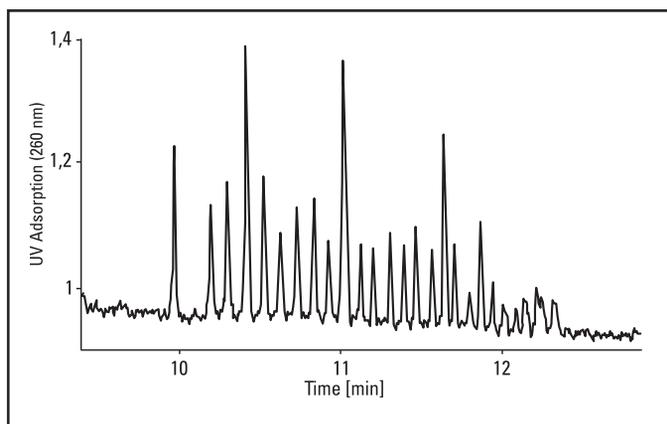
$\mu$ SIL-WAX features a modified, polyethylene oxide, hydrophilic coating made through a special cross-linking and bonding process. The coating effectively masks active silanol sites, offering exceptional efficiency, resolution, peak shape and reproducibility. The highly stable coating and near-zero EOF of  $\mu$ SIL-WAX makes the capillary ideal for CE-MS, and protein and peptide separations from pH 2-5.

Capillary	ID ( $\mu$ m)	Total Length (cm)	Effective Length (cm)	Film Thickness ( $\mu$ m)	Unit	Part No.
$\mu$ SIL-FC	50	80	50	0.075	3/pk	194-8111
$\mu$ SIL-DNA	75	65	50	0.075	2/pk	199-2602
$\mu$ SIL-WAX	50	100	75	0.1	2/pk	196-7203
$\mu$ SIL-WAX	100	100	75	0.1	2/pk	197-7202

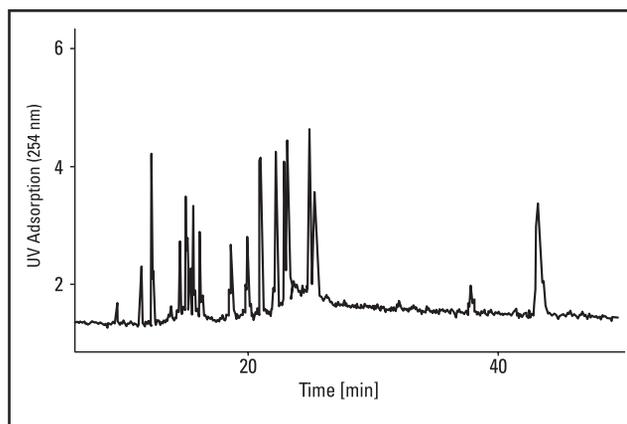
## Bulk $\mu$ SIL-DB Capillaries

$\mu$ SIL-DB coated capillaries are available as  $\mu$ SIL-DB-1 and  $\mu$ SIL-DB-17. In combination with a cellulose based buffer system,  $\mu$ SIL-DB coated capillaries have been widely used in cIEF applications, PCR product and DNA fragment separation, and many other CE applications which require reduced EOF.

Capillary	ID (mm)	Length (m)	Film Thickness ( $\mu$ m)	Part No.
DB-1	0.05	10	0.05	126-1012
DB-1	0.20	10	0.05	126-1013
DB-1	0.10	10	0.10	127-1012
DB-17	0.10	10	0.05	126-1713
DB-17	0.10	10	0.10	127-1712
DB-17	0.20	10	0.10	127-1713



Analysis of Allelic ladder with  $\mu$ SIL-DNA



Analysis of Myoglobin tryptic digest using  $\mu$ SIL-WAX

## Capillary Electrochromatography (CEC) Capillaries

Capillary electrochromatography is a hybrid of CE and LC and can be performed in the Agilent CE system. Using CE capillaries packed with LC stationary phases, CEC offers the loadability and selectivity of LC and the high efficiency of CE.

Using the high pressure capabilities of the Agilent CE system, both ends of the CEC capillary can be pressurized. This process prevents outgassing upon application of high voltage and significantly extends capillary lifetime.

Use CEC to improve resolution of solutes, which are difficult to resolve by HPLC, for hydrophobic solutes which cannot be solubilized in MEKC buffers, or for reduced sample and solvent consumption compared to HPLC.

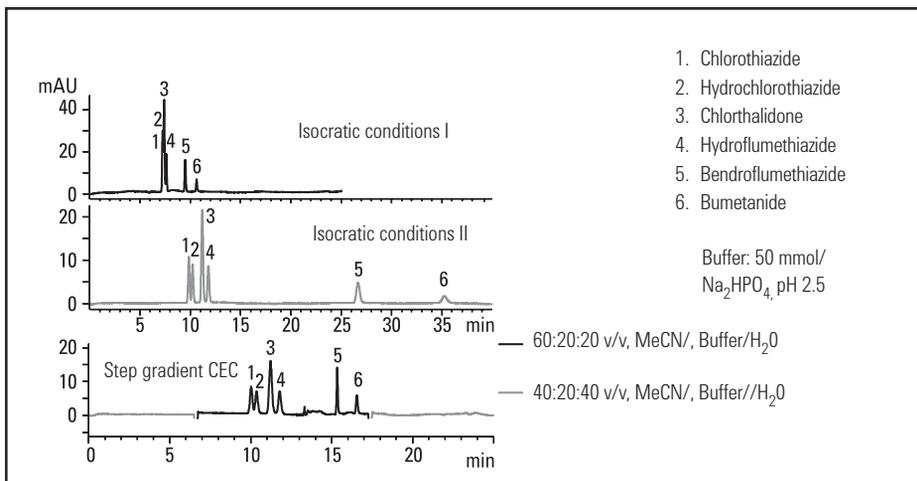
### Standard Packed CEC Capillaries, 2/pk

Description	ID (µm)	Total Length (cm)	Effective Length (cm)	Color Code*	Part No.
C18, 3 µm	100	33.5	25	Gray	5063-6512
	100	48.5	40	Gray	5063-6513
C8, 3 µm	100	33.5	25	Gray	5063-6535
	100	48.5	40	Gray	5063-6540
Phenyl, 3 µm	100	33.5	25	Gray	5063-6536
	100	48.5	40	Gray	5063-6541
Hypersil/Phenyl, 3 µm	100	48.5	40	Gray	5063-6544

\*The color coding of the capillary (alignment stopper) and the interface allows you to easily combine the correct alignment interface with the capillary.

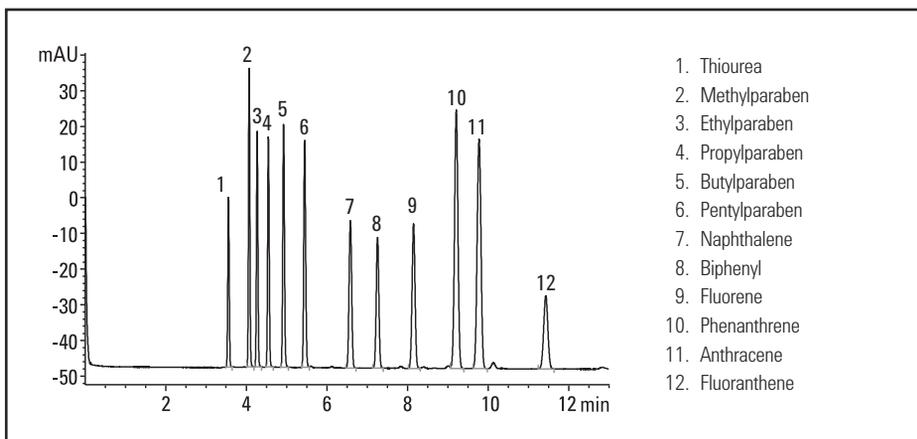


CEC C8 Capillaries, 2/pk, 5063-6535



Capillary Electrochromatography of diuretic test mixture

(courtesy of Dr. Melvin Euerby, Astra Chamwood, UK)



Capillary Electrochromatography of parabens and aromatics

**TIPS & TOOLS**

CEC capillaries require an Agilent CE system with external gas supply capabilities.



## Alignment Interfaces and Capillary Cassette

Agilent Technologies alignment interfaces are an integral part of the Agilent diode-array detection (DAD) system. These interfaces contain optical slits which are precisely matched to the capillary inner diameter for optimized sensitivity and linear detection range.

In combination with the capillary cassette, alignment interfaces simplify capillary exchange, protect the fragile detection window and ensure exact alignment of the window in the detector. Quick-change cassette allows capillary exchange in less than one minute.

**Note:** The color code of the alignment interface must match the color code of the capillary's built-in alignment stopper.



Alignment interface for standard capillary,  
G1600-60310



Capillary cassette, G7100-60002

### Alignment Interfaces

Description	ID (µm)	Color Code	Corresponding Capillary	G7100 CE Part No.	G1600 CE Part No.
Alignment interface for standard capillary	50	Green	Green	G7100-60210	G1600-60210
	75	Blue	Blue	G7100-60310	G1600-60310
	100	Gray	Gray		
	150	Brown	Brown		
Alignment interface for Agilent Extended Light Path capillaries	25	Black	Black	G7100-60150	G1600-60150
	50	Red	Red	G7100-60230	G1600-60230
	75	Yellow	Yellow	G7100-60330	G1600-60330
CE/MS alignment interface for 360 µm od capillaries, nonmetallic		Blue	Blue Gray	G7100-60400	

**Note:** 75, 100 and 150 µm id standard capillaries use the same interface (color blue).

PVA coated 50 and 75 µm id capillary for CE/MS use the same nonmetallic interface with color code blue for use with standard and extended light path capillaries, and the high sensitivity detector cell.

### Capillary cassette

Description	G7100 CE Part No.	G1600 CE Part No.
Capillary cassette	G7100-60002	G1600-60002

**Note:** Only use G7100-60002 cassette in G7100 and G1600-60002 cassette in G1600. Never mix cassettes.

### Optical filter for DAD

Description	G7100 CE Part No.	G1600 CE Part No.
Optical filter for DAD 260 nm, for DNA analysis with polyacrylamide filled capillaries and oligonucleotide analysis	G7100-62700	G1600-62700

### TIPS & TOOLS



Cassette and interfaces accept all commercially available capillaries (~365 µm od).

## Instrument Parts and Supplies

### High Sensitivity Detection Cell

The Agilent high sensitivity detection cell – a technological leap which extends sensitivity by an order of magnitude – provides a solution to sensitivity limitations often encountered in CE. This improvement will substantially increase the utility of CE for impurity analysis of chiral drugs, biologicals, and compounds of environmental interest, among others.

The high linear range allows quantification of both <0.1% impurities and the main component in one run. This is useful for all impurity determinations and is especially useful for determining chiral excess.

The high sensitivity detection cell for the Agilent CE system not only improves detection sensitivity more than 10-fold over standard capillaries, but also extends linearity beyond 2000 mAU and provides unsurpassed spectral fidelity. These improvements are a result of a proprietary micromachined design which increases the detection pathlength from 75  $\mu\text{m}$  to 1200  $\mu\text{m}$  while dramatically reducing stray light.

The high sensitivity detection cell has a design comprised of a fused-silica cell body and removable capillaries. The light path through the cell is made from black fused-silica which significantly minimizes stray light and defines the aperture for the diode-array spectrometer. In addition, the reflective interior functions as a "lightpipe," ensuring almost 100% transmission of light which entered the cell. These properties result in enhanced linearity and unsurpassed spectral fidelity with the diode-array detector.



High Sensitivity Detection Cell

## Characteristics of the Agilent High Sensitivity Detection Cell

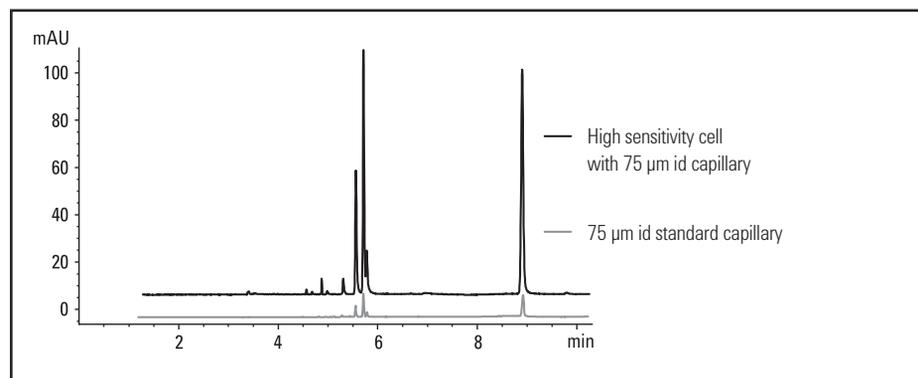
- Up to 10-fold increase in signal-to-noise
- Detector linearity beyond 2000 mAU for accurate quantitative analysis
- Decoupled design allows replaceable capillaries and reduced cost operation
- Special capillary geometry ensures maintenance of peak symmetry
- Full diode-array spectral capabilities
- Design fits all Agilent CE instruments

### High Sensitivity Detection Cell

Description	G7100 CE Part No.	G1600 CE Part No.
High sensitivity cell kit Includes detection cell, 75 $\mu$ m id inlet capillary (72 cm) and outlet capillary (8.5 cm) pair, capillary cassette, fittings (3 fitting screws with seals, 2 fitting caps), cleaning solution, CE Partner CD-ROM	G7100-68723	G1600-68723
CE cell fitting kit Includes 3 fitting screws, 2 fitting caps		G1600-63200
Replacement detection cell		G1600-60027
Cell cleaning fluid, 1 L		5062-8529

### Capillary Kits for High Sensitivity Detection Cell

Description	Effective Length (cm)	G1600 CE Part No.
75 $\mu$ m capillary kit with 8.5 cm outlet	56	G1600-68716
	72	G1600-68715
	88	G1600-68714
PVA coated 75 $\mu$ m capillary kit with 8.5 cm outlet	56	G1600-68319



Agilent high sensitivity detection cell vs. 75  $\mu$ m standard capillary for the CZE separation of naphthalene sulfonic acids

## CE/MS Accessories

The CE/MS Adapter Kit simplifies coupling the Agilent CE system with MS systems equipped with an electrospray ionization (ESI) source. Integral to this kit is the CE/MS cassette, which completely thermostats the capillary until it exits the CE system. The cassette offers multiple capillary paths that vary the capillary length. A method development configuration uses online diode array detection and MS. For rapid or routine MS analysis, the detector can be bypassed to decrease the total capillary length and reduce analysis time. The CE/MS adapter kit can be used with the complete Agilent 6000 Series mass spectrometers, or virtually any electrospray-MS platform.

The CE/MS cassette completely thermostats the capillary until it exits the CE system. Methods development configuration uses online diode array detection (DAD) and MS. For rapid or routine MS analysis the DAD can be by-passed to decrease the total capillary length and reduce analysis time.

The CE/MS Sprayer Kit includes the electrospray needle and splitter assembly, which allows the direct connection of the CE instrument with Agilent and other electrospray MS systems. The CE/MS Sprayer Kit needs the CE/MS Adapter Kit to fully support CE/MS coupling.

CE with tandem UV-Vis and MS detection allows the analysis of complex mixtures. Analyte mixtures are separated and the components detected via UV-Vis absorption, allowing preliminary identification based on peak elution time and UV-Vis spectra, or both, when compared to a standard. Online coupling to electrospray-ionization mass spectrometry (ESI-MS) then reveals unambiguous information on the solute's molecular weight, and possibly structure.

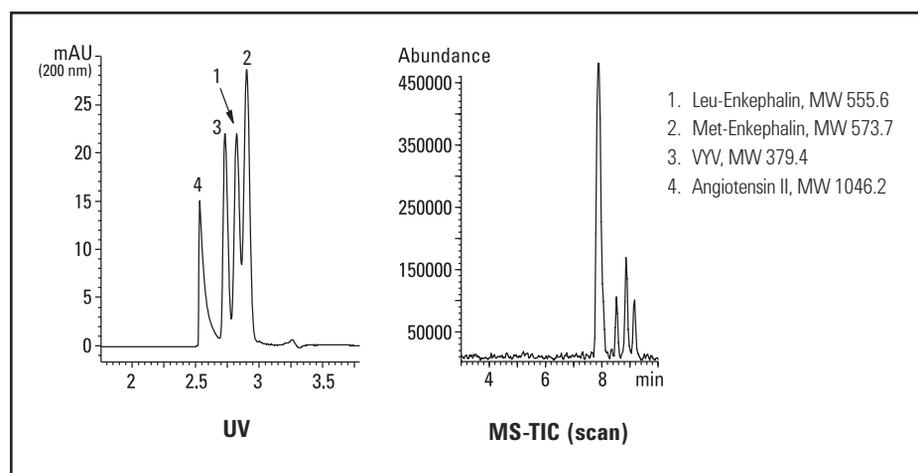


Interfacing the capillary requires an electrospray needle which is not included in this kit but in the CE-ESI-MS Nebulizer Kit. For coupling with non-Agilent MS please contact the MS vendor.

### CE/MS Adapter Kit

Description	Part No.
CE/MS Adapter Kit	G1603A
For interfacing the Agilent CE system with a mass spectrometer Includes parts below, which can be ordered separately*	
CE/MS interface cassette, metallic, for G1600 and G7100 CE	G1600-60013
CE/MS alignment interface for 360 $\mu\text{m}$ od capillaries, nonmetallic, for G1600 CE	G1600-60400
CE/MS alignment interface for 360 $\mu\text{m}$ od capillaries, nonmetallic, for G7100 CE	G7100-60400
Bare fused-silica, 50 $\mu\text{m}$ id, 125 cm long, 2/pk	G1600-67311

\*Interfacing the capillary requires an electrospray needle which is not included in this kit



CE/MS of 4-component peptide mixture (210 fmol)

**CE/MS Sprayer Kit**

Description	Unit	Part No.
CE/MS Sprayer Kit		G1607A
Includes CE/MS test sample (5 g quinine sulfate dihydrate) and the parts listed below		
ES needle assembly		G1607-60041
CE-ESI sprayer		G1607-60001
Splitter assembly		G1607-60000
PEEK ferrule, 360 µm for CE/MS Sprayer		5022-2141
Nut, finger-tight fitting and ferrule	2/pk	0100-1543
Flex loc element	2/pk	1520-0401
Gasket	1/pk	G1607-20030
Ion kit (ammonium acetate)	5 x 5 mL	8500-4410

**CE/MS Capillaries**

Description	Color Code	Unit	Part No.
Bare fused-silica, 50 µm id, 125 cm long	Green	2/pk	G1600-67311
Bare fused-silica, 50 µm id, 100 cm long	Green	2/pk	G1600-67312
PVA coated capillary, 50 µm id, 125 cm long	Green	1/pk	G1600-67219
PVA coated capillary, 50 µm id, 100 cm long	Green	1/pk	G1600-67220
PVA coated capillary, 75 µm id, 125 cm long	Blue	1/pk	G1600-67319

## CE Standards & Reagents

Premade buffers help eliminate the time-consuming buffer preparation process. All Agilent buffers and reagents are designed to meet the stringent demands of CE. Manufactured under GLP/GMP conditions in ISO 9001 facilities, each is shipped with assay information and verification of purity. Chemicals are all electrophoresis grade, with nearly all ionic and organic impurities removed. Solutions are prepared under Class 10 clean room conditions and prefiltered through 0.2  $\mu\text{m}$  filters to ensure removal of particulates. Superior quality control ensures reproducible results bottle-to-bottle and batch-to-batch.

In addition to a set of kit buffers, which are specially designed for dedicated applications, Agilent offers a series of basic CZE buffers covering a broad pH range. The product portfolio also includes special buffers for protein analysis and for Micellar Electrokinetic Chromatography (MEKC). Cleaning and conditioning solutions complete the offering.



Ultra pure CE water, 5062-8578

### Ultra Pure CE Water

Description	Volume (mL)	Part No.
Ultra pure CE water	500	5062-8578



0.1 N sodium hydroxide, 5062-8575

### Capillary Conditioning Solutions

Description	Volume (mL)	Part No.
0.1 N sodium hydroxide	250	5062-8575
1.0 N sodium hydroxide	250	5062-8576
0.1 N phosphoric acid	250	5062-8577

### CZE Buffers for Charged Analytes

Description	Volume (mL)	Part No.
50 mM sodium phosphate buffer, pH 2.5	250	5062-8571
50 mM sodium phosphate buffer, pH 7.0	250	5062-8572
50 mM sodium tetraborate buffer, pH 9.3	250	5062-8573
20 mM sodium tetraborate buffer, pH 9.3	100	8500-6782



50 mM sodium phosphate buffer, pH 2.5,  
5062-8571

### CZE Buffers for Proteins

Description	Volume (mL)	Part No.
50 mM phosphate, 0.05% hydroxyethyl cellulose buffer, pH 2.5	250	8500-6786
150 mM phosphate, 200 mM ammonium sulfate buffer, pH 7.0	250	8500-6787

### MEKC Buffers for Neutral and Charged Analytes

Description	Volume (mL)	Part No.
50 mM sodium tetraborate, 100 mM sodium dodecyl sulfate buffer, pH 9.3*	250	5062-8574

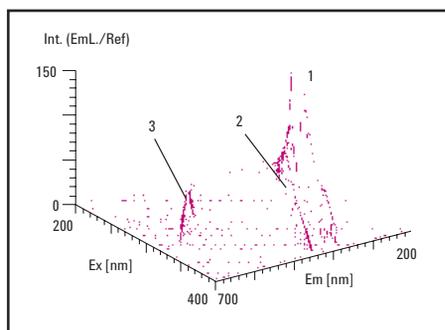
\*Dilute with 50 mM sodium tetraborate, pH 9.3 (P/N 5062-8573) to reduce SDS concentration without affecting the tetraborate composition or pH

### Plating Bath Analysis Buffer

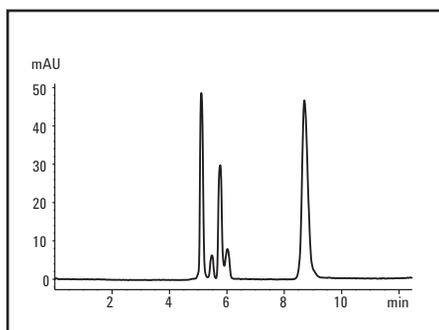
Description	Volume (mL)	Part No.
Plating bath analysis buffer	250	5064-8236

### μPAGE Buffer Solutions and Oligo Standards

Description	Part No.
μPAGE tris-borate and urea buffer for μPAGE-10, 4 x 237 mL	590-4005
μPAGE tris-borate and urea buffer for μPAGE-3 and μPAGE-5, 4 x 237 mL	590-4001
μPAGE pd(A) <sub>25-30, 40-60</sub> oligonucleotide standard for μPAGE-3 and μPAGE-5, 3 x 50 μL	590-4000



The total fluorimetry spectrum of the 50 mM borate buffer pH 9.2 verifies that the solution is free of fluorescence-active impurities (1 and 2 = Rayleigh stray light of zero and first order, 3 = Raman stray light).



CZE analysis of a peptide mixture using pre-made 50 mM sodium phosphate buffer, pH 2.5

## CE System Start-up and Test Kits

Chemical test kits and validation packages are available to help comply with regulatory and quality standards. The Installation Qualification (IQ) Chemical Kit and Hardware Start-Up Kits, which are shipped with new instruments, are useful for rapidly verifying system functionality. For rigorous testing, the Operational Qualification (OQ)/Performance Verification (PV) Kit can be used to verify DAD noise, drift, linearity, wavelength accuracy and replenishment functionality. The OQ/PV kit is only part of the validation services available from Agilent Technologies. When implemented by qualified Agilent personnel, our service packages can be used to help validate your Agilent CE system.



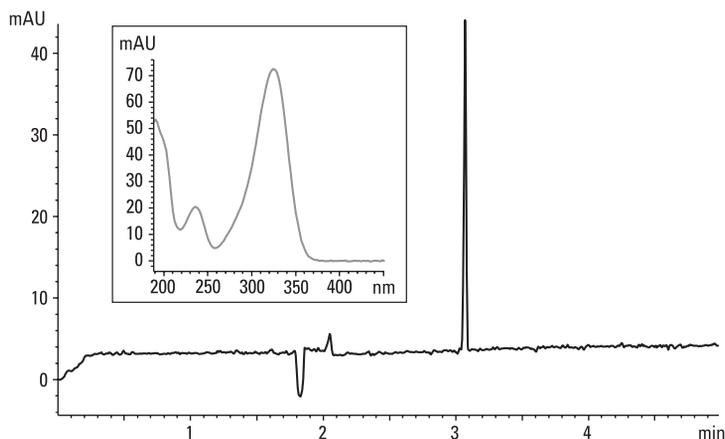
CE System Start-up and Test Kits

### CE System Start-up and Test Kits

Description	Part No.
CE Installation Qualification (IQ) Kit Includes buffer (20 mM borate, pH 9.3, 100 mL), test sample (4-(hydroxy)-acetophenone, 2 mL), capillary conditioning solution (0.1 N sodium hydroxide, 100 mL)	5063-6514
CE Operational Qualification Performance Verification (OQ/PV) Chemical Kit Includes buffer (20 mM borate, pH 9.3, 100 mL), test samples (0.1, 0.5, 1.0, and 5.0 mM 4-(hydroxy)-acetophenone, 2 mL ea.), capillary conditioning solution (0.1 N sodium hydroxide, 100 mL), test capillary (L 48.5 cm, I 40 cm, id 50 µm), diskette with methods, sequence, spectral library. <b>Note:</b> Method is supported for G1600 only.	5063-6515
CE OQ/PV Chemicals Only Kit Includes buffer (20 mM borate, pH 9.3, 100 mL), test samples (0.1, 0.5, 1.0, and 5.0 mM 4-(hydroxy)-acetophenone, 2 mL)	5063-6520

#### IQ and OQ/PV test method

Sample:	p-Hydroxyacetophenone
Buffer:	20 mM Borate pH 9.2
Capillary:	I = 40 cm, L = 48.5 cm, 50 µm id
Injection:	250 mbar*s
Voltage:	30 kV
Temperature:	20 °C
Detector:	192/4 nm



## Vials and Caps for CE

Description	Unit	Part No.
Crimp/snap top vial, 1 mL, Polypropylene, crimp/snap top	100/pk	5182-0567
Clear, wide opening crimp/snap top vial, 2 mL	100/pk	5182-9697
Clear, wide opening crimp/snap top glass vial, 2 mL	500/pk	5183-4623
Amber, wide opening crimp/snap top vial, write-on spot, 2 mL	100/pk	5183-4619
Crimp/snap top vial, 250 µL	1000/pk	9301-0978
Snap caps PEO (polyethylene olefin for chemical resistance)	100/pk	5181-1507
Snap caps PEO (polyethylene olefin for chemical resistance)	500/pk	5181-1513
Snap caps PUR (polyurethane for resealing)*	100/pk	5181-1512
Snap caps PUR (polyurethane for resealing)*	500/pk	5042-6491

\*PUR caps are recommended to help prevent sample or buffer evaporation even after multiple injections

## Instrument Supplies

Description	Unit	Part No.
Long life HiS Deuterium lamp (8-pin) with RFID tag		5190-0917
Deuterium lamp		2140-0585
Electrode assembly, standard (for G1600 only)		G1600-60007
Electrode assembly, short (for G1600 only)		G1600-60033
Electrode assembly, standard (for G7100 only)		G7100-60007
Electrode assembly, short (for G7100 only)		G7100-60033
Electrode O-ring, silicone	5/pk	5062-8544
Electrolyte bottle, 500 mL		9300-1748
Electrolyte bottle, 100 mL		5042-6478
Electrolyte bottle cap		9300-1747
Bottle sealing O-ring		0905-1163
Glass filter, solvent inlet, 20 µm		5041-2168
Filter frit adapter, 3 mm	4/pk	5062-8517
Bottle cap plug		G1600-23223
Air filter, 5 µm		3150-0619
Pre-puncher		G1600-67201
Screws for pre-puncher/insulation plate holding	10/pk	G1600-62402



Snap caps, polyurethane, 5181-1512, 5042-6491



Electrode assembly, standard (for G1600 only), G1600-60007



Electrode O-ring, silicone, 5062-8544



Electrolyte bottle, 500 mL, 9300-1748



Filter frit adapters, 5062-8517



Air filter, 5 µm, 3150-0619



Screws for pre-puncher/insulation plate holding, G1600-62402



Pre-puncher, G1600-67201



Vial rack, 9301-0722

### Accessories

Description	Part No.
CE accessory kit Includes electrode tool, screwdriver, fuses, air filter, glass frit, vials and caps alignment interfaces (red and green) standard and 50 µm id capillaries: L 64.5 cm, Standard: L 64.5 cm, Extended Light Path: L 48.5 cm	G7100-68705
Rack for 12 mm, 2 mL vials, holds 50 vials per rack, 5/pk	9301-0722
CE column cutter	5183-4669
Diamond blade replacement kit for CE column cutter	5183-4670
Capillary tubing cutter, 4/pk	5181-8836



CE column cutter, 5183-4669

### Window Etching Tool

The window etching tool is designed for fast, convenient and reproducible preparation of detection windows on fused-silica capillaries. The polyimide coating is removed without destroying the inner polymeric coating. The tool contains three glass blocks with fine grooves, precisely controlling the size of the windows.

Description	Part No.
Window etching tool, 3/pk	590-3003



Window etching tool, 590-3003

# Troubleshooting

## Basic Capillary Electrophoresis Troubleshooting

Symptom	Possible Cause	Solution(s)
<b>Unstable Current</b>		
Variable or no current	Air bubble formed in capillary	Flush capillary, ramp voltage to limit initial heating, and/or degas buffers.
	Clogged capillary	Flush capillary with absorbing solution (such as NaOH). A "step" on the baseline should be observed when viewing the online signal at 200 nm. If still plugged, flush manually with syringe or high pressure gas.
	Broken capillary	Replace capillary.
	No or incorrect solution in buffer vials	Fill/change buffer vials.
	Large volume injection	Normal situation. Current should stabilize during analysis.
<b>Unstable Baseline</b>		
Spikes in baseline	Precipitates in buffer	Filter buffer through 0.2 or 0.45 $\mu$ m filter.
	Micro air bubbles in buffer	Degas buffer by ultrasonication or vacuum.
	Precipitation of sample	Verify that sample components are sufficiently soluble in buffer.
Noisy baseline	Optical slit in capillary interface is occluded	Clean slit with methanol or water. View under magnifier.
	Aging deuterium lamp	Use DAD test to measure lamp output and time-on. Replace if necessary.
	Data acquisition rate too high	Determine peak width and decrease acquisition rate if appropriate.
	Improper reference wavelength	Acquire UV spectrum during analysis. Use lowest wavelength possible without impinging where sample absorbs. Also use wide bandwidth.
	Buffer absorbs at detection wavelength	Use minimally UV-absorbing buffers such as phosphate and borate, especially below 210 nm.
Drifting baseline	Improper capillary alignment	Re-seat capillary cartridge in detector block.
	Unequilibrated temperature	Allow 10-20 minutes for equilibration after opening top cover.
	Lamp recently ignited	Allow 15-30 minutes for equilibration after igniting lamp.

(Continued)

## Basic Capillary Electrophoresis Troubleshooting

Symptom	Possible Cause	Solution(s)
<b>Poor Peak Efficiency</b>		
Broad peaks	Sample overloading	Decrease sample injection or concentration.
	Excessive Joule heating	Reduce voltage, buffer conductivity, or capillary id.
Skewed peaks	Mismatched sample buffer ion mobilities	Match mobilities or increase difference between buffer and sample conductivity.
	Sample overloading	Decrease sample injection or concentration.
Tailing peaks	Adsorption to capillary wall	Use pH extremes, high buffer concentrations, polymer additives, or coated capillary.
<b>Poor Migration Time Reproducibility</b>		
Adsorption to capillary walls	Changes in EOF caused by buffer (especially phosphates and detergents) or sample adsorption	Condition capillary and allow sufficient equilibration time. Replace capillary.
Hysteresis of wall charge	Caused by conditioning capillary at high (or low) pH and employing a low (or high) pH running buffer	Avoid pH differences. Allow sufficient equilibration time.
Changes in buffer composition	pH changes due to electrolysis	Replenish buffer.
	Buffer evaporation	Tightly cap buffer vials and reduce carousel temperature.
	Conditioning solution waste flushed into outlet reservoir	Use separate vial to collect waste.
	Conditioning solution carried over into buffer vial	First dip capillary in separate buffer or water vial.
Buffer reservoirs not level	Generation of laminar flow	Level liquid in reservoirs. If not replenishing buffer, do not use inlet vial for flushing capillary.
Different silanol content of capillary batches	Different wall charge and variations in EOF	Measure EOF and normalize.
Temperature changes	Changes in viscosity and EOF	Use system with capillary thermostating.

(Continued)

### Basic Capillary Electrophoresis Troubleshooting

Symptom	Possible Cause	Solution(s)
<b>Poor Peak Area Reproducibility</b>		
Sudden application of high voltage	Heating, thermal expansion of buffer, and expulsion of sample	Ramp separation voltage or inject buffer plug after sample.
Sample evaporation	Increasing sample concentration and peak area	Cap vials and/or reduce temperature of sample carousel.
Instrumental limitations	System rise time significant proportion of injection time	Increase injection time.
Sample carry-over	Extraneous injection	Use capillary with flat, smooth injection end. Remove polyimide from end of capillary.
Zero-injection caused by simply dipping the capillary in the sample	Extraneous injection	Cannot be totally eliminated. Increase injection amount to minimize effect.
Sample adsorption to capillary walls	Distorted peak shape (tailing) Non-eluting sample	Change buffer pH. Increase buffer concentration. Use additive such as cellulose or coated capillary.
Low signal-to-noise ratio	Integration errors	Optimize integration parameters. Increase sample concentration. Use peak height.
Temperature changes of capillary environment	Changes in viscosity and injection amount	Use system with capillary thermostating.

# Product Index

## Agilent Supplies

<b>Autosamplers</b>	
Injection Valves .....	61
Kits .....	66-67
Loop Capillaries .....	64
Maintenance Schedule .....	61
Metering Device .....	64
Needles and Needle Seats .....	62-63
Trays .....	65
<b>Bio-inert Quaternary</b>	
Autosampler .....	101-102
Column Compartment .....	102
Detectors .....	102
Fittings .....	102
Pumps .....	101
Valves .....	102
<b>Capillaries</b>	
1200 and 1100 Prep LC Systems .....	26
1220/1120 Infinity Series LC Systems .....	33
1260 Bio-inert LC System .....	30
1260/1200/1100 Infinity Series LC Systems .....	23
1290 Infinity Series LC Systems .....	24
1290 Valve Head .....	25-27
Loop .....	32
Miscellaneous .....	27-29
PEEK Coated Fused Silica Capillaries – 100 µL/min Flow .....	32
PEEK Coated Fused Silica Capillaries – 20 µL/min Flow .....	31
PEEK Coated Fused Silica Capillaries for Nano LC .....	31
Chip LC .....	100
<b>Detectors</b>	
80 nL and 500 nL Flow Cell .....	95-96
Diode Array Detector (DAD)/ Multiple Wavelength Detector (MWD) .....	93
Evaporative Light Scattering Detector (ELSD) .....	98
Fluorescence Detector (FLD) .....	99
Lamps .....	90
Maintenance .....	89
Maintenance Kits .....	97
Preparative Flow Cells .....	96
Refractive Index Detector (RID) .....	98
Variable Wavelength Detector (VWD) .....	91-92
<b>Fittings and Unions</b>	
Capillary and Fittings Kits .....	36-39
Fittings .....	40-41
How to Align Connection Properly .....	45
How to Prepare Connection .....	44
How to Tighten Correctly .....	43
<b>Fraction Collectors</b>	
Capillary Kits and Needles .....	70
Collecting Tubes and Trays .....	69
G1364D Micro Fraction Collector .....	71
Maintenance Schedule .....	68
Well Plate Trays .....	69
In-Line Filters .....	12
<b>LC/MS</b>	
Chemicals .....	107
Cleaning Supplies .....	108
Foreline Pump .....	107

Gas Purifiers .....	108
Instrument Supplies .....	105-106
Maintenance Schedule .....	103
Preventive Maintenance Kit .....	104
Quiet Cover .....	109
<b>Standards</b>	
Analyzer Kit .....	110
Calibrant Mixes .....	110
Kits .....	110
Tools .....	108
Loop Capillaries .....	32
<b>Pumps</b>	
1290 Infinity LC Pump Supplies .....	51
Frits and Adapters .....	54
Inlet Valves .....	49
Kits .....	59-60
Outlet Valves .....	49
Pistons and Seals .....	50
Purge Valves .....	48
Routine Maintenance .....	47
Safety Caps .....	55
Seal Wash .....	52
Solvent Filters .....	54
Solvent Reservoir .....	53
Vacuum Degassers .....	58
Rack for LC Systems .....	14
Solvent Filters/Degassers .....	13
Standards .....	15
Thermostatted Column Compartment Capillary Kits .....	83-88
Tools .....	11
Troubleshooting .....	546-549
<b>Tubing</b>	
Accessories .....	35
PEEK .....	34
Rigid Capillary Tubing .....	35
Unions .....	42
<b>Valves</b>	
Injection Valves .....	73
Maintenance Notes .....	72
<b>Manual Injection Valves</b>	
with Position Sensing Switches .....	76-77
Sample Loops .....	78-79
<b>Switching Valves</b>	
External Switching Valve .....	74
Internal Switching Valve .....	75
<b>Syringes for Manual Injection</b>	
Fitted Plungers .....	80
PTFE-Tipped Plungers .....	81
<hr/>	
<b>Applications</b>	
BioPharmaceutical .....	552
Chemical/Industrial .....	580
Environmental .....	583
Food and Consumer Products .....	594
Pharmaceutical .....	611

## CE and CE/MS

Alignment Interface .....	190
<b>CE/MS Accessories</b>	
Adapter Kit .....	194
Capillaries .....	195
Sprayer Kit .....	195
<b>Capillaries</b>	
Alignment Interface .....	190
Bulk Fused-Silica .....	181
CEP Coated .....	185
Capillary Cassette .....	190
Capillary Electrochromatography (CEC) .....	188-189
Cross-linked and Bonded µSIL .....	186-187
<b>Extended Light Path</b>	
(Bubble Cell) Bare Fused-Silica .....	179-180
Polyvinyl Alcohol (PVA) Coated .....	182-184
Standard Bare Fused-Silica .....	178
Universal Bare Fused-Silica .....	181
Capillary Cassette .....	190
High Sensitivity Detection Cell .....	191-192
Instrument Supplies .....	199
<b>Solution Kits</b>	
Cation .....	173
Forensics .....	175
Inorganic Anion .....	171-172
Organic Acids .....	174
µPAGE .....	176-177
<b>Standards &amp; Reagents</b>	
CZE Buffers for Charged Analytes .....	196
CZE Buffers for Proteins .....	197
Capillary Conditioning Solutions .....	196
MEKC Buffers for Neutral and Charged Analytes .....	197
Plating Bath Analysis Buffer .....	197
Ultra Pure CE Water .....	196
µPAGE Buffer Solutions and Oligo Standards .....	197
System Start-up and Test Kits .....	198
Troubleshooting .....	201-203
Vial Rack .....	200
Vials and Caps .....	199
Window Etching Tool .....	200

## Columns for Biomolecule Separations

<b>Affinity Chromatography</b>	
Agilent Bio-Monolith Protein A .....	434-435
Multiple Affinity Removal System .....	438-440
Multiple Affinity Removal System Starter Kits .....	441
Protein Fractionation System .....	437
Proteomic Reagents .....	442
mRP-C18 High-Recovery Protein .....	442-443
<b>Analysis Scale</b>	
Capillary and Nano .....	452
MicroBore (1.0 mm id) .....	461
ZORBAX Bio-SCX Series II .....	458
<b>Citations</b>	
PL-SAX .....	487
PL-SCX .....	487
PLRP-S .....	486-487
Poroshell 300 .....	486
ZORBAX 300 .....	485

Column Selection	
Amino Acid Analysis.....	362
Broad Distribution.....	363
DNA and RNA Oligonucleotide.....	360
Natural and Synthetic Peptides.....	358
Peptide Mapping.....	356
Protein.....	353
Ion-Exchange Chromatography	
Agilent Bio IEX.....	402
Agilent Bio MAb.....	399
Agilent Bio-Monolith.....	412-413
PL-SAX Strong Anion-Exchange.....	406
PL-SCX Strong Cation-Exchange.....	410
Literature.....	477-484
Method Development	
Bio Ion-Exchange Column.....	447
High Sensitivity Capillary Column.....	451
Reversed-Phase LC/MS Column.....	446
SEC Column.....	449-450
ZORBAX Columns.....	444
Purification - Prep HPLC	
PL-SAX and PL-SCX.....	472-473
PLRP-S.....	467-468
Peptide Purification	
VariPure IPE.....	476
VariTide RPC.....	475
ZORBAX PrepHT.....	466
Reversed-Phase HPLC	
PLRP-S.....	387
Poroshell 120.....	385
Poroshell 300.....	380-381
ZORBAX 300Extend-C18.....	376
ZORBAX 300StableBond.....	367
ZORBAX Eclipse	
Amino Acid Analysis (AAA).....	394-395
ZORBAX RRHD 300-Diphenyl.....	374
Size Exclusion Chromatography (SEC)	
Agilent Bio SEC-3.....	418
Agilent Bio SEC-5.....	424
ProSEC 300S.....	428
ZORBAX GF-250 and GF-450.....	431

## Columns for Small Molecule Separations

Column Selection	
Column and Mobile Phase Guidelines.....	211-213
Method Development.....	220-221
Quick Guide to Reversed-Phase.....	207-209
Small Molecule Overview.....	218-219
Fast Columns for Reversed-Phase HPLC/UHPLC	
Fast Guards for UHPLC.....	246
Poroshell 120.....	228
ZORBAX Rapid Resolution	
High Definition (RRHD) 1.8 $\mu$ m.....	233
ZORBAX Rapid Resolution	
High Throughput (RRHT) 1.8 $\mu$ m.....	239
Guard Columns.....	223-224
Kits for Analytical HPLC	
ZORBAX Method Development Kits.....	284-285
ZORBAX Method Validation Kits.....	286-288
Oligo Solutions	
StratoSpheres DNA Cartridges.....	347
TOP Cartridges.....	348-349

Other HPLC Techniques	
Hi-Plex for Carbohydrate Analysis.....	340
ZORBAX HILIC Plus.....	324
ZORBAX Ion-Exchange.....	333
ZORBAX Normal-Phase.....	326-328
Preparative HPLC	
Bulk Materials.....	321
Load & Lock.....	322
Polaris Prep.....	321
Prep LC.....	311-312
Pursuit and Pursuit XRs Prep.....	319
ZORBAX PrepHT.....	314
Reversed-Phase HPLC	
HC-C18(2).....	304-305
PLRP-S.....	306
Polaris.....	298
Pursuit.....	287-288
TC-C18(2).....	304-305
ZORBAX 80Å Extend-C18.....	274
ZORBAX 80Å StableBond.....	264
ZORBAX Bonus-RP.....	278
ZORBAX Eclipse PAH.....	254
ZORBAX Eclipse Plus.....	248
ZORBAX Eclipse XDB.....	256
ZORBAX Original.....	283
ZORBAX Rx.....	272
USP Designations.....	343-346

## CrossLab Supplies

Autosampler Maintenance.....	119
Autosampler Syringes.....	116-118
CTC HPLC Autosamplers	
Autosampler Syringes.....	169
Capillaries and Tubing.....	130
Detector Lamps.....	113
Dionex HPLC Systems	
Autosampler Supplies.....	158
Autosampler Syringes.....	157
Buffer Loops.....	160
Capillaries.....	166-168
Detector Lamps.....	157
Fittings, Ferrules and Unions.....	168
In-Line Filters.....	168
Performance Maintenance Kits.....	161-165
Pump Maintenance Procedure.....	126
Pump Supplies.....	158-159
Sample Loops.....	160
Tubing.....	168
Valve Replacement Parts.....	159
Fittings.....	131
In-Line Filters.....	132
Performance Maintenance Kits.....	129
Pump Maintenance.....	124
Pump Supplies.....	122-123
Sealing Mats.....	115
Shimadzu HPLC Systems	
Autosampler Syringes.....	150
Capillaries.....	154
Detector Lamps.....	150
Fittings, Ferrules and Unions.....	155
In-Line Filters.....	156
Performance Maintenance Kits.....	154

Pump Maintenance Procedure.....	125
Pump Supplies.....	151-152
Sample Loops.....	153
Tubing.....	155
Valve Replacement Parts.....	152-153
Troubleshooting.....	133-136
Valve Supplies.....	127-128
Waters HPLC Systems	
Autosampler Syringes.....	137-138
Capillaries.....	148
Detector Lamps.....	137
Detector Supplies.....	142
Fittings, Ferrules and Unions.....	149
Performance Maintenance Kits.....	144-158
Pump Maintenance Procedure.....	124
Pump Supplies.....	139-142
Sample Loops.....	143
Valve Replacement Parts.....	142
Well Plates.....	115

## GPC/SEC Columns and Standards

Aqueous	
PL aquagel-OH Analytical.....	525
PL aquagel-OH Preparative.....	528
Column Accessories.....	529
Organic	
PLgel Individual Pore Size.....	505
PLgel MIXED.....	498-501
PLgel MIXED-LS.....	502
PLgel MiniMix.....	504
PLgel Preparative.....	506
Polymer Standards	
EasiCal.....	536
EasiVial.....	532
Polyacrylic Acid.....	545
Polyethylene Glycol/Oxide.....	541-542
Polymethylmethacrylate.....	539-540
Polysaccharides.....	543-544
Polystyrene.....	537-538
Setting Up a GPC/SEC System.....	491-495
Special Application	
EnviroPrep.....	507
MesoPore.....	520
OligoPore.....	521
PL HFIPgel.....	509
PL Rapide.....	510-511
PLgel Olexis.....	508
PlusPore.....	514-515
PolarGel.....	512
PolyPore.....	516
ResiPore.....	518

## Part Number Index

0100-0549.....	107	0101-1250.....	79	1535-4045.....	74-75, 77	443905-902.....	313
0100-0900.....	42	0101-1251.....	79	1535-4046.....	77	443910-901.....	313
0100-0969.....	105	0101-1252.....	79	1535-4860.....	79	443910-902.....	313
0100-1259.....	41	0101-1253.....	77	1535-4970.....	104, 107	446905-101.....	313
0100-1516.....	40, 92, 96, 99, 106	0101-1254.....	77	1535-5045.....	77	446905-102.....	313
0100-1543.....	195	0101-1255.....	77	1535-5082.....	77	446905-301.....	313
0100-1597.....	107	0101-1258.....	75	160-2644-5.....	181	446905-302.....	313
0100-1631.....	40	0101-1267.....	61, 73	160-2650-5.....	181	446905-901.....	313
0100-1710.....	11, 58	0101-1268.....	61, 73	160-2660-5.....	181	446905-902.....	313
0100-1847.....	42	0101-1288.....	74-75	190-0131.....	181	446910-102.....	313
0100-1849.....	61, 73	0101-1360.....	75	190-0231.....	181	449905-101.....	313
0100-1850.....	75, 77	0101-1362.....	75	190-0331.....	181	449905-102.....	313
0100-1851.....	61, 73-75, 77, 101-102	0101-1385.....	61, 73	190-0431.....	181	449905-301.....	313
0100-1852.....	75	0101-1409.....	74-75, 77, 102	191-1311.....	177	449905-302.....	313
0100-1853.....	61, 73	0101-1415.....	74-75	191-3211.....	177	449905-501.....	313
0100-1854.....	75, 108	0101-1416.....	61, 73, 101	191-5211.....	177	449905-502.....	313
0100-1855.....	75, 104, 108	0101-1417.....	74-75, 77	192-1311.....	176	449905-901.....	313
0100-1859.....	77	0101-1421.....	74-75	192-3211.....	176	449905-902.....	313
0100-1860.....	77	0101-1422.....	61, 73	192-5211.....	176	449910-902.....	313
0100-1921.....	79	0101-2415.....	61, 73	194-8111.....	186	5001-3702.....	82
0100-1922.....	79	01018-22707.....	48	196-7203.....	186	5001-3726.....	14
0100-1923.....	79	01018-23702.....	11	197-7202.....	186	5001-3743.....	52
0100-1924.....	79	01018-60025.....	54	199-2602.....	186	5021-1816.....	28
0100-2051.....	104, 108	01018-68722.....	59	204310.....	442	5021-1817.....	28
0100-2086.....	41	01048-87302.....	28	2140-0585.....	199	5021-1818.....	28
0100-2087.....	75	01078-87302.....	32, 64	2140-0590.....	90	5021-1819.....	28-29
0100-2088.....	61, 73	01078-87305.....	28	2140-0600.....	99	5021-1820.....	27
0100-2089.....	75	01080-68702.....	15	2140-0813.....	90	5021-1821.....	27
0100-2175.....	40	01080-68704.....	15	2140-0820.....	90	5021-1822.....	27
0100-2231.....	61, 73	01080-83202.....	40	280959-904.....	12	5021-1823.....	27, 92
0100-2233.....	75	01090-27609.....	12	280959-907.....	12	5021-1845.....	262, 270
0100-2298.....	42	01090-68702.....	12	3150-0509.....	13	5021-1866.....	11
0100-2304.....	106	01090-68703.....	12	3150-0576.....	13	5022-2133.....	42
0100-2410.....	35	01090-87304.....	28	3150-0577.....	13	5022-2141.....	195
0100-2441.....	42	01090-87306.....	23, 33	3150-0619.....	199	5022-2144.....	42
0101-0376.....	79	01090-87610.....	23	3150-0944.....	54	5022-2145.....	42
0101-0377.....	79	01090-87611.....	23	3162-0178.....	106	5022-2146.....	95
0101-0378.....	79	01100-68700.....	11	3162-1056.....	107	5022-2155.....	58
0101-0379.....	79	05971-80103.....	106	3162-1057.....	107	5022-2159.....	27
0101-0620.....	77	05980-60051.....	108	400510.....	442	5022-2165.....	12
0101-0623.....	77	0890-1727.....	107	410910-101.....	313	5022-2166.....	12
0101-0921.....	61, 73	0890-1761.....	34	410910-102.....	313	5022-2175.....	64
0101-1050.....	61, 73	0890-1762.....	34	410910-301.....	313	5022-2184.....	42, 95
0101-1219.....	79	0890-1763.....	34, 102	410910-302.....	313	5022-2185.....	12
0101-1226.....	79	0890-1915.....	34, 106	410910-501.....	313	5022-2188.....	51
0101-1227.....	79	0905-1163.....	199	410910-502.....	313	5022-2192.....	48, 54
0101-1228.....	79	0905-1175.....	52	413910-101.....	313	5022-6503.....	82
0101-1229.....	79	0905-1192.....	48	413910-102.....	313	5022-6509.....	29
0101-1230.....	79	0905-1294.....	64	413910-301.....	313	5022-6510.....	29
0101-1231.....	77	0905-1420.....	51	413910-302.....	313	5022-6531.....	69
0101-1232.....	77	0905-1516.....	54	413910-501.....	313	5022-6532.....	69
0101-1233.....	77	0905-1599.....	64	413910-502.....	313	5022-6533.....	69
0101-1234.....	79	0905-1717.....	64	419910-301.....	313	5022-6534.....	69
0101-1235.....	79	0905-1718.....	52	419910-302.....	313	5022-6536.....	41
0101-1236.....	79	0905-1719.....	51	419910-501.....	313	5022-6538.....	65, 69
0101-1237.....	79	0905-1731.....	101	419910-502.....	313	5022-6539.....	65, 69
0101-1238.....	79	12102300.....	349	420212-901.....	313	5022-6541.....	71
0101-1239.....	79	12102301.....	349	420212-902.....	313	5022-6542.....	71
0101-1240.....	79	126-1012.....	187	420420-901.....	313	5022-6543.....	71
0101-1241.....	79	126-1013.....	187	420910-901.....	313	5022-6544.....	71
0101-1242.....	79	126-1713.....	187	420910-902.....	313	5022-6546.....	71
0101-1243.....	79	127-1012.....	187	440905-901.....	313	5023-0208.....	71
0101-1244.....	79	127-1712.....	187	440905-902.....	313	5023-0209.....	71
0101-1245.....	79	127-1713.....	187	440910-901.....	313	5023-0213.....	71
0101-1246.....	79	1400-0563.....	107	440910-902.....	313	5023-0214.....	71
0101-1247.....	79	14251921.....	349	443905-101.....	313	5023-0215.....	71
0101-1248.....	79	1460-2571.....	104-105, 108	443905-102.....	313	5023-0238.....	71
0101-1249.....	79	1520-0401.....	195	443905-901.....	313	5023-0271.....	12

5023-0282.....	11	5061-3362.....	35	5064-8264.....	373, 460	5065-9978.....	34, 52
5023-1803.....	42	5062-2418.....	40	5064-8265.....	373, 460	5067-1540.....	41
5041-2168.....	54, 199	5062-2461.....	23	5064-8266.....	373, 460	5067-1547.....	41
5042-1385.....	69	5062-2462.....	23-24, 33-34, 99	5064-8267.....	373, 460	5067-1551.....	12
5042-1386.....	69	5062-2463.....	34, 99	5064-8268.....	373, 460	5067-1553.....	12
5042-1388.....	69	5062-2478.....	395	5064-8269.....	263	5067-1555.....	12
5042-1389.....	69	5062-2479.....	395	5064-8270.....	373, 460	5067-1557.....	41
5042-6454.....	69	5062-2483.....	34, 58	5064-8271.....	263	5067-1558.....	41
5042-6458.....	69	5062-2484.....	52	5064-8273.....	12	5067-1562.....	12
5042-6459.....	69	5062-2486.....	11	5064-8286.....	263	5067-1565.....	54
5042-6461.....	34	5062-8517.....	54, 199	5064-8287.....	263	5067-1581.....	77
5042-6462.....	34	5062-8522.....	23, 92	5064-8288.....	263	5067-1582.....	100
5042-6463.....	34	5062-8524.....	172, 175	5064-8291.....	263	5067-1584.....	100
5042-6470.....	69	5062-8529.....	192	5064-8293.....	64	5067-1585.....	100
5042-6476.....	15	5062-8534.....	58	5064-8294.....	373, 460	5067-1595.....	84
5042-6478.....	199	5062-8535.....	23, 33, 92	5064-8295.....	373, 460	5067-1596.....	85
5042-6491.....	199	5062-8541.....	40	5064-8296.....	263	5067-1597.....	85
5042-6500.....	40	5062-8544.....	199	5064-8297.....	263	5067-4104.....	77
5042-8502.....	69	5062-8562.....	49	5064-8298.....	263	5067-4105.....	77
5042-8507.....	52	5062-8571.....	196	5064-8300.....	373, 460	5067-4107.....	75
5042-8517.....	42, 71	5062-8572.....	196	5065-4402.....	69	5067-4108.....	75
5042-8518.....	42, 71	5062-8573.....	196	5065-4410.....	41	5067-4111.....	75
5042-8519.....	42, 71	5062-8574.....	197	5065-4420.....	15	5067-4112.....	75
5042-8922.....	58	5062-8575.....	172, 196	5065-4421.....	53	5067-4113.....	75
5042-8954.....	52	5062-8576.....	172, 174, 196	5065-4422.....	41, 95	5067-4114.....	61, 73
5042-8957.....	196	5062-8577.....	196	5065-4423.....	41	5067-4117.....	74-75
5042-9954.....	11	5062-8578.....	172-175, 196	5065-4426.....	40	5067-4118.....	74-75
5042-9967.....	11	5062-8587.....	64	5065-4427.....	460	5067-4121.....	75
5043-0221.....	56	5062-8588.....	82	5065-4454.....	40	5067-4124.....	51
5043-0222.....	56	5063-6502.....	77	5065-4459.....	373, 460	5067-4131.....	74, 101
5043-0223.....	56	5063-6506.....	63	5065-4460.....	373, 460	5067-4132.....	74-75
5043-0224.....	56	5063-6510.....	174	5065-4461.....	373, 460	5067-4134.....	74-75
5043-0225.....	56	5063-6511.....	172	5065-4462.....	373, 460	5067-4137.....	75
5043-0226.....	56	5063-6512.....	188	5065-4463.....	373, 460	5067-4141.....	77
5043-0227.....	56	5063-6513.....	188	5065-4464.....	379, 460	5067-4142.....	74-75
5043-0228.....	57	5063-6514.....	198	5065-4465.....	379, 460	5067-4144.....	74-75
5043-0229.....	57	5063-6515.....	198	5065-4466.....	379, 460	5067-4146.....	74-75
5043-0230.....	57	5063-6520.....	198	5065-4467.....	379, 460	5067-4148.....	74-75
5043-0231.....	57	5063-6526.....	82	5065-4468.....	384, 460	5067-4158.....	77
5043-0232.....	56-57	5063-6531.....	53	5065-4498.....	66	5067-4159.....	74-75, 102
5043-0233.....	57	5063-6535.....	188	5065-4499.....	60	5067-4170.....	75
5043-0234.....	56	5063-6536.....	188	5065-4500.....	12	5067-4174.....	48
5043-0235.....	57	5063-6540.....	188	5065-9901.....	12	5067-4202.....	77
5043-0236.....	57	5063-6541.....	188	5065-9908.....	110	5067-4601.....	83-85
5043-0237.....	57	5063-6544.....	188	5065-9910.....	373, 460	5067-4607.....	29
5043-0238.....	57	5063-6586.....	50, 64	5065-9911.....	373, 460	5067-4608.....	28-29
5043-0239.....	57	5063-6589.....	51, 64	5065-9912.....	458, 460	5067-4609.....	29
5043-0242.....	56	5063-6591.....	40	5065-9913.....	373, 460	5067-4633.....	37
5043-0243.....	56	5063-6592.....	95	5065-9914.....	373, 460	5067-4638.....	12
5043-0255.....	57	5063-6593.....	41, 95	5065-9915.....	373, 460	5067-4646.....	38, 84, 86
5043-0272.....	56	5063-6597.....	15, 99	5065-9922.....	60	5067-4647.....	25
5043-0300.....	56	5063-6598.....	58	5065-9923.....	373, 460	5067-4648.....	28
5043-0828.....	56	5063-6599.....	58	5065-9924.....	373, 460	5067-4649.....	25
5043-0829.....	56	5064-8203.....	173	5065-9926.....	29	5067-4650.....	25
5043-0830.....	56	5064-8205.....	173	5065-9927.....	29	5067-4651.....	25
5043-0831.....	56	5064-8206.....	173	5065-9931.....	28	5067-4653.....	26
5043-0832.....	56	5064-8208.....	175	5065-9932.....	28	5067-4657.....	24
5061-3303.....	40, 99	5064-8209.....	175	5065-9933.....	28-29	5067-4658.....	24
5061-3304.....	39	5064-8211.....	11	5065-9935.....	27	5067-4659.....	24
5061-3315.....	39	5064-8220.....	15	5065-9937.....	36	5067-4660.....	24
5061-3327.....	99	5064-8236.....	197	5065-9938.....	36	5067-4661.....	51
5061-3328.....	99	5064-8253.....	271	5065-9939.....	37	5067-4662.....	67
5061-3329.....	99	5064-8254.....	271	5065-9942.....	458, 460	5067-4669.....	24
5061-3330.....	395	5064-8255.....	271	5065-9947.....	37, 82	5067-4670.....	24
5061-3331.....	395	5064-8256.....	271	5065-9948.....	35, 41	5067-4678.....	50
5061-3332.....	395	5064-8257.....	271	5065-9950.....	35, 41	5067-4682.....	38, 86
5061-3333.....	395	5064-8258.....	271, 460	5065-9952.....	52	5067-4684.....	25
5061-3334.....	395	5064-8259.....	373, 460	5065-9963.....	28	5067-4685.....	28
5061-3335.....	395	5064-8260.....	271	5065-9964.....	27	5067-4686.....	25
5061-3337.....	395	5064-8261.....	271	5065-9967.....	40	5067-4687.....	25
5061-3339.....	395	5064-8262.....	271	5065-9971.....	34, 42	5067-4688.....	28
5061-3361.....	35	5064-8263.....	373, 460	5065-9976.....	34	5067-4689.....	26

## PART NUMBER INDEX

5067-4695.....	50, 64, 101-102	5069-3637.....	412	5188-6557.....	439	5190-2433.....	405
5067-4697.....	51	5069-3639.....	435	5188-6558.....	439	5190-2434.....	405
5067-4699.....	59	5080-5400.....	108	5188-6559.....	439	5190-2435.....	405
5067-4703.....	32, 64	5133001.....	349	5188-6560.....	439	5190-2436.....	405
5067-4710.....	32, 64	5133005.....	349	5188-6562.....	439	5190-2439.....	405
5067-4716.....	51	5180-4108.....	40, 99	5188-8283.....	441	5190-2440.....	405
5067-4717.....	51	5180-4114.....	40, 99	5188-8825.....	439	5190-2441.....	405
5067-4728.....	48-49	5181-1507.....	199	5188-8826.....	439	5190-2442.....	405
5067-4729.....	39, 87	5181-1512.....	199	5190-0443.....	110	5190-2443.....	405
5067-4730.....	87	5181-1513.....	199	5190-0469.....	110	5190-2444.....	405
5067-4733.....	40	5181-1541.....	71	5190-0488.....	15	5190-2445.....	405
5067-4735.....	25	5181-8836.....	200	5190-0551.....	110	5190-2446.....	405
5067-4737.....	28	5182-0567.....	199	5190-0554.....	110	5190-2447.....	405
5067-4738.....	40	5182-1530.....	90	5190-0555.....	110	5190-2448.....	405
5067-4739.....	40	5182-9697.....	199	5190-0556.....	110	5190-2451.....	405
5067-4741.....	42, 102	5182-9710.....	106	5190-0917.....	90, 199	5190-2452.....	405
5067-4744.....	25	5183-2021.....	285	5190-0924.....	11	5190-2453.....	405
5067-4745.....	25	5183-2022.....	285	5190-1401.....	108	5190-2454.....	405
5067-4746.....	26	5183-4619.....	199	5190-1431.....	284	5190-2455.....	405
5067-4767.....	88	5183-4623.....	199	5190-1432.....	284	5190-2456.....	405
5067-4769.....	88	5183-4624.....	285	5190-1433.....	284	5190-2459.....	405
5067-4777.....	29	5183-4625.....	285	5190-1434.....	284	5190-2460.....	405
5067-4778.....	29	5183-4626.....	285	5190-1435.....	284	5190-2461.....	405
5067-4779.....	29	5183-4627.....	285	5190-1436.....	284	5190-2462.....	405
5067-4780.....	29	5183-4669.....	200	5190-1443.....	104	5190-2463.....	405
5067-4781.....	29	5183-4670.....	200	5190-1480.....	80	5190-2464.....	405
5067-4782.....	29	5185-5807.....	285	5190-1484.....	80	5190-2465.....	405
5067-4798.....	58	5185-5808.....	285	5190-1485.....	80	5190-2466.....	405
5067-4800.....	87	5185-5809.....	285	5190-1486.....	80-81	5190-2467.....	405
5067-5103.....	38, 88	5185-5810.....	285	5190-1492.....	81	5190-2468.....	405
5067-5104.....	25	5185-5920.....	269, 372, 463	5190-1494.....	80	5190-2471.....	405
5067-5106.....	25	5185-5921.....	261	5190-1499.....	81	5190-2472.....	405
5067-5107.....	25	5185-5922.....	282	5190-1501.....	80	5190-2473.....	405
5067-5109.....	26	5185-5923.....	277	5190-1505.....	81	5190-2474.....	405
5067-5110.....	26	5185-5968.....	384, 463	5190-1508.....	80	5190-2475.....	405
5067-5111.....	26	5185-5984.....	439	5190-1512.....	81	5190-2476.....	405
5067-5112.....	26	5185-5985.....	439	5190-1515.....	80	5190-2479.....	405
5067-5113.....	26	5185-5986.....	441	5190-1520.....	81	5190-2480.....	405
5067-5120.....	28	5185-5987.....	441	5190-1522.....	80	5190-2481.....	405
5067-5189.....	39	5185-5988.....	441	5190-1526.....	81	5190-2482.....	405
5067-5378.....	58	5185-5990.....	441	5190-1558.....	81	5190-2483.....	405
5067-5380.....	58	5185-5991.....	441	5190-1560.....	81	5190-2484.....	405
5067-5383.....	58	5188-2743.....	13	5190-1561.....	81	5190-2485.....	405
5068-0001.....	75	5188-2744.....	13	5190-1562.....	81	5190-2486.....	405
5068-0002.....	75	5188-2745.....	13	5190-1564.....	81	5190-2487.....	405
5068-0004.....	48	5188-2746.....	13	5190-1571.....	81	5190-2488.....	405
5068-0005.....	48	5188-5217.....	439	5190-2401.....	401	5190-2491.....	405
5068-0006.....	74-75	5188-5218.....	439	5190-2402.....	401	5190-2492.....	405
5068-0007.....	61, 73	5188-5230.....	439	5190-2403.....	401	5190-2493.....	405
5068-0008.....	74-75	5188-5231.....	442	5190-2404.....	401	5190-2494.....	405
5068-0011.....	74-75	5188-5249.....	441	5190-2405.....	401	5190-2495.....	405
5068-0012.....	74-75	5188-5250.....	441	5190-2406.....	401	5190-2496.....	405
5068-0040.....	74-75, 102	5188-5251.....	441	5190-2407.....	401	5190-2499.....	405
5068-0041.....	74-75, 102	5188-5252.....	441	5190-2408.....	401	5190-2500.....	405
5068-0044.....	74-75	5188-5253.....	441	5190-2411.....	401	5190-2501.....	423
5068-0045.....	74-75, 102	5188-5254.....	441	5190-2412.....	401	5190-2502.....	423
5068-0052.....	77	5188-5289.....	439	5190-2413.....	401	5190-2503.....	423
5068-0053.....	77	5188-5321.....	69	5190-2414.....	401	5190-2504.....	423
5068-0060.....	74-75, 77, 101-102	5188-5322.....	69	5190-2415.....	401	5190-2505.....	423
5068-0067.....	74-75	5188-5332.....	439	5190-2416.....	401	5190-2506.....	423
5068-0076.....	74-75	5188-5333.....	439	5190-2419.....	401	5190-2507.....	423
5068-0077.....	74-75	5188-5334.....	439	5190-2420.....	401	5190-2508.....	423
5068-0082.....	77	5188-5336.....	439	5190-2421.....	405	5190-2509.....	423
5068-0093.....	74-75	5188-5341.....	439	5190-2422.....	405	5190-2510.....	423
5068-0095.....	74-75	5188-6408.....	439	5190-2423.....	405	5190-2511.....	423
5068-0097.....	74-75	5188-6409.....	439	5190-2424.....	405	5190-2512.....	423
5068-0115.....	75	5188-6410.....	439	5190-2425.....	405	5190-2513.....	423
5068-0116.....	75	5188-6411.....	439	5190-2426.....	405	5190-2514.....	423
5068-0122.....	48	5188-6510.....	442	5190-2427.....	405	5190-2515.....	423
5068-0123.....	48	5188-6511.....	442	5190-2428.....	405	5190-2516.....	427
5069-3635.....	412	5188-6523.....	110	5190-2431.....	405	5190-2517.....	427
5069-3636.....	412	5188-6529.....	15	5190-2432.....	405	5190-2518.....	427

5190-2519	427	687975-302	229	726975-302	243, 277	8001-0405	150
5190-2520	427	687975-902	229	726975-902	243, 276	8001-0406	150
5190-2521	427	689775-902	229	727700-902	243, 277	8001-0501	151
5190-2522	427	689775-906	229	727975-302	243, 277	8001-0502	151
5190-2523	427	689775-914	229	727975-902	243, 276	8001-0503	151
5190-2524	427	689975-302	229	728700-902	243, 277	8001-0504	151
5190-2525	427	689975-306	229	728975-302	243, 277	8001-0506	152
5190-2526	427	689975-314	229	728975-902	243, 276	8001-0509	154
5190-2527	427	689975-902	229	735700-902	277	8001-0510	152
5190-2528	427	689975-906	229	735953-902	276	8001-0511	152
5190-2529	427	689975-914	229	735954-302	276	8001-0512	152
5190-2530	427	691775-902	229	746450-902	276	8001-0513	152
5190-2531	427	691775-906	229	75400001	349	8001-0514	151
5190-2532	427	691975-302	229	75700001	349	8001-0515	151
5190-2533	427	691975-306	229	7571901C	349	8001-0516	152
5190-2534	427	691975-902	229	75719025	349	8001-0517	154
5190-2535	427	691975-906	229	75719050	349	8001-0519	152
5190-2536	427	693768-901	229	7572915B	349	8001-0520	152
5190-2537	427	693775-901	325	7572915C	349	8001-0521	152
5190-2538	427	693775-902	229, 386	7573915B	349	8001-0522	151
5190-2539	427	693775-906	229	7573915C	349	8001-0527	152
5190-2540	427	693775-912	229	757700-302	238, 277	8001-0528	152
5190-2541	427	693968-301	229	757700-902	238, 277	8001-0529	152
5190-2542	427	693968-901	229	758700-302	238, 277	8001-0530	152
5190-2543	427	693975-301	325	758700-902	238, 277	8001-0531	152
5190-2544	427	693975-302	229, 386	759700-302	238	8001-0532	152
5190-2545	427	693975-306	229	759700-902	238, 277	8001-0533	151
520518-904	305	693975-312	229	760450-902	277	8001-0534	151
520518-905	305	693975-901	325	761600-902	277	8001-0535	152
588905-902	305	693975-902	229, 386	761753-902	277	8001-0601	153
588915-902	305	693975-906	229	761775-902	379	8001-0603	153
588925-902	305	693975-912	229	761973-902	379	8001-0604	153
588935-902	305	695768-901	229	763600-902	277	8001-0607	153
590-3003	200	695775-901	325	763750-902	379	8001-0608	153
590-4000	177, 197	695775-902	229, 386	763953-902	276	8001-0609	153
590-4001	177, 197	695775-906	229	763954-302	276	8001-0610	154
590-4005	177, 197	695775-912	229	763973-902	379	8001-0612	153
59980-20134	107	695968-301	229	764953-302	276	8001-0613	153
59987-20033	107	695968-901	229	764953-902	276	8001-0614	153
59987-20040	105	695975-302	229, 386	765600-902	277	8001-0615	152
6040-0798	107	695975-306	229	765750-902	379	8001-0701	150
6040-0834	104, 107	695975-312	229	765973-902	379	8001-0702	150
660750-902	210, 384	695975-901	325	766953-902	276	8001-0703	150
660750-906	384	695975-902	210, 229, 386	770050-902	277, 318	8001-0704	150
660750-909	384	695975-906	229	770100-902	277, 318	8001-0705	150
661750-902	384, 463	695975-912	229	770150-902	277, 318	8001-0801	153
661750-906	384, 463	697775-902	229	770450-302	276	8001-0802	153
661750-909	384, 463	697775-906	229	770450-902	276	8001-0803	155
670750-902	384	697975-302	229	770995-902	379	8001-0805	155
671750-902	384, 463	697975-306	229	773450-302	276	8001-0806	155
681775-902	229	697975-902	210, 229	773450-902	276	8001-0807	155
681975-302	229	697975-906	229	773700-902	277	8001-0808	156
681975-902	229	699768-901	229	773995-902	379	8001-0809	153
683775-902	229, 386	699775-901	325	79835-87638	29	8001-0810	154
683775-906	229	699775-902	229	79841-87610	27	8001-0812	153
683775-914	229	699775-906	229	7995108-344	262	8001-0813	155
683975-302	229, 386	699775-912	229	7995108-585	262	8001-0814	153
683975-306	229	699968-301	229	7995108-595	262	8001-0816	155
683975-314	229	699968-901	229	7995118-344	262	8001-0817	155
683975-902	229, 386	699975-301	325	7995118-504	262, 270	8001-0818	154
683975-906	229	699975-302	229	7995118-585	262	8001-0819	155
683975-914	229	699975-306	229	7995118-595	262	8001-0821	154
685775-902	229, 386	699975-312	229	7995208-344	270	8001-0822	154
685775-906	229	699975-901	325	7995208-585	270	8001-0823	155
685775-914	229	699975-902	229	7995208-595	270	8001-0824	155
685975-302	229, 386	699975-906	229	7995218-344	270	8001-8020	154
685975-306	229	699975-912	229	7995218-585	270-271	8002-0401	157
685975-314	229	722975-902	245	7995218-595	270	8002-0402	157
685975-902	229, 386	724700-902	243, 277	7995230-344	262	8002-0403	157
685975-906	229	724975-302	243, 277	8001-0401	150	8002-0404	157
685975-914	229	724975-902	243, 276	8001-0402	150	8002-0405	157
687775-902	229	726700-902	243, 277	8001-0403	150	8002-0406	157

# PART NUMBER INDEX

8002-0407	157	8002-0917	161	8005-0911	145	820950-908	330
8002-0408	157	8002-0918	162	8005-0912	145	820950-911	433
8002-0412	157	8002-0919	162	8005-0913	144	820950-912	283
8002-0413	157	8002-0921	168	8005-0914	146	820950-913	273
8002-0414	157	8002-0923	164	8005-0915	144	820950-914	273
8002-0415	157	8002-0924	164	8005-0916	144	820950-915	269
8002-0501	158	8005-0414	138	8005-0925	145	820950-916	269
8002-0502	158	8005-0416	138	8005-0926	145	820950-917	269
8002-0515	158	8005-0417	138	8005-0927	146	820950-918	372
8002-0516	159	8005-0418	138	8005-0928	144	820950-919	329
8002-0517	159	8005-0419	138	8005-0929	145	820950-920	269
8002-0601	158	8005-0420	138	8005-0930	144	820950-921	372
8002-0602	159	8005-0422	138	8010-0440	169	820950-922	269
8002-0603	159	8005-0423	138	8010-0441	137, 169	820950-923	372
8002-0604	159	8005-0508	141	8010-0442	137, 169	820950-924	283, 372
8002-0605	159	8005-0512	142	8010-0443	137, 169	820950-925	261
8002-0607	159	8005-0513	141	8010-0444	137, 169	820950-926	261
8002-0608	159	8005-0514	139	8010-0445	137, 169	820950-927	261
8002-0610	165	8005-0515	140	8010-0446	137, 169	820950-928	282
8002-0611	165	8005-0516	140	8010-0448	137, 169	820950-930	277
8002-0701	157	8005-0523	140	8010-0449	169	820950-931	394
8002-0702	157	8005-0524	141	8010-0450	137, 169	820950-932	379
8002-0703	157	8005-0525	141	8010-0455	137, 169	820950-933	269
8002-0704	157	8005-0526	141	8010-0456	137, 169	820950-935	261, 329
8002-0705	157	8005-0527	140	8010-0457	137, 169	820950-936	253
8002-0706	157	8005-0528	142, 145	8010-0458	137, 169	820950-937	253
8002-0802	168	8005-0529	140	8010-0459	137, 169	820950-938	253
8002-0803	168	8005-0530	140	8010-0460	137, 169	820950-939	253, 255
8002-0805	168	8005-0531	140	8010-0467	137, 169	820999-901	225, 253, 255, 261, 269, 273, 277, 282-283, 305, 329-330, 334, 372, 379, 384, 394, 433
8002-0806	168	8005-0532	142	8010-0468	137, 169		
8002-0808	158	8005-0533	140	820212-911	433		
8002-0809	158	8005-0535	139	820212-914	273, 318		
8002-0810	158	8005-0536	139	820212-915	269, 273, 317	821075-918	384
8002-0811	160	8005-0537	141	820212-918	317, 373, 466	821075-920	384
8002-0815	167	8005-0538	139	820212-919	318, 329	821075-924	384
8002-0816	167	8005-0539	140	820212-920	269, 317	821125-915	269, 273
8002-0817	167	8005-0540	140	820212-921	317, 373, 466	821125-918	372
8002-0818	166	8005-0541	139	820212-924	317, 373, 466	821125-919	329
8002-0819	166	8005-0601	142	820212-925	261, 318	821125-924	269, 372
8002-0820	166	8005-0602	142	820212-926	261, 318	821125-926	261
8002-0821	166	8005-0603	142	820212-928	282, 318	821125-928	282
8002-0822	166	8005-0604	142	820212-930	277, 318	821125-930	277
8002-0823	166	8005-0605	142	820212-933	269, 317	821125-932	379
8002-0824	166	8005-0702	137	820385-901	318	821125-933	269
8002-0825	166	8005-0704	137	820400-901	261, 269, 273, 277, 282-283, 313, 317-318, 329-330, 373, 433, 466	821125-935	261, 329
8002-0826	166	8005-0705	137			821125-936	253
8002-0831	166	8005-0812	148	820444-901	261, 269, 273, 277, 282, 313, 317-318, 329-330, 373, 433, 466	821125-937	253
8002-0832	166	8005-0822	148			821125-938	253
8002-0833	166	8005-0823	148			821125-939	253, 255
8002-0834	166	8005-0824	148			821700-902	245, 270
8002-0835	167	8005-0825	148	820555-901	245, 263, 270	821700-932	245, 270
8002-0837	166	8005-0826	148	820675-111	330, 433	821725-901	238, 243, 246, 253
8002-0856	160	8005-0835	148-149	820675-112	261	821725-902	238, 244, 246, 269
8002-0857	160	8005-0836	149	820675-115	269, 273, 283	821725-903	238, 243, 246, 261
8002-0858	160	8005-0837	149	820675-119	329-330	821725-904	238, 244, 246, 269
8002-0859	160	8005-0838	143, 149, 156	820675-124	269, 283, 372	821725-911	229, 246
8002-0860	160	8005-0839	143	820700-902	244, 269	821725-912	229, 246
8002-0901	164	8005-0840	143	820700-905	244, 269	821725-913	229, 246
8002-0902	164	8005-0841	143	820700-906	244, 269	821725-914	229, 246
8002-0903	164	8005-0842	143	820700-912	244, 269	821975-902	245, 270
8002-0904	163	8005-0843	143	820750-901	243, 246, 252	821975-932	245, 270
8002-0905	164	8005-0844	143	820750-902	244, 246, 267	822700-902	270
8002-0906	163	8005-0845	143	820750-903	243, 246, 260	822700-932	270
8002-0907	161	8005-0846	143	820750-904	244, 246, 267	822975-902	244-245, 270
8002-0908	161	8005-0901	146	820750-911	229, 246	822975-906	245, 270
8002-0909	162	8005-0902	146	820750-912	229, 246	822975-932	270
8002-0910	162	8005-0903	146	820750-913	229, 246	823700-902	245, 270
8002-0911	161	8005-0904	146	820750-914	229, 246	823700-932	245, 270
8002-0912	162	8005-0905	147	820950-901	330	823750-901	238, 243, 246, 253
8002-0913	163	8005-0906	147	820950-902	283	823750-902	238, 244, 246, 268
8002-0915	165	8005-0907	146	820950-905	283, 330	823750-903	238, 243, 246, 260
8002-0916	165	8005-0908	147	820950-906	283	823750-904	238, 244, 246, 268

823750-911	229, 246	829975-302	244, 268	858700-314	238	863750-906	372
823750-912	229, 246	829975-305	244, 268	858700-902	238, 268	863953-902	267
823750-913	229, 246	829975-306	244, 268	858700-905	238, 268	863953-905	267
823750-914	229, 246	829975-312	244, 268	858700-906	238, 268	863953-906	267
823975-902	245, 270	829975-902	244, 267	858700-912	238, 268	863953-912	267
823975-932	245, 270	829975-905	244, 267	858700-914	238	863953-914	267
824700-902	244, 269	829975-906	244, 267	858750-902	372	863954-302	267
824700-905	244, 269	829975-912	244, 267	858750-906	372	863954-305	267
824700-906	244, 269	829975-914	244, 267	858750-909	372	863954-306	267
824700-912	244, 269	830668-901	244, 281	858750-944	372, 374, 375	863954-312	267
824700-914	244, 269	830975-906	244, 267	858768-901	238, 281	863954-314	267
824975-302	244, 268	830990-902	268	859700-302	238, 268	863967-302	273
824975-305	244, 268	830990-906	268	859700-306	238, 268	863967-902	273
824975-306	244, 268	830990-914	268	859700-902	238, 268	863973-902	210, 372
824975-902	244, 267	831975-902	270	859700-905	238, 268	863973-905	372
824975-905	244, 267	831975-906	270	859700-906	238, 268	863973-906	372
824975-906	244, 267	831975-932	270	859700-912	238, 268	863973-909	372
824975-912	244, 267	831975-936	270	859700-914	238	863974-302	372
824975-914	244, 267	832975-902	267	859768-901	238, 281	863974-306	372
825700-902	245, 270	832975-906	267	860700-304	334	863974-309	372
825700-932	245, 270	833975-902	270	860700-704	334	864668-301	281
825975-902	245, 270	833975-906	270	860700-708	330	864668-901	281
825975-932	245, 270	833975-912	270	860950-902	372	865600-902	269
826700-902	244, 269	833975-932	270	860950-905	372	865600-906	269
826700-906	244, 269	833975-936	270	860950-906	372	865608-901	282
826975-302	244, 268	834975-902	267	860950-909	372	865630-902	372, 463
826975-306	244, 268	834975-906	267	860975-902	268	865630-906	372, 463
826975-902	244, 267	835668-901	281	860975-905	268	865750-902	372
826975-906	244, 267	835975-902	267	860975-906	268	865750-906	372
827668-301	244, 281	835975-905	267	860975-909	268	865973-902	210, 372
827668-901	244, 281	835975-906	267	860975-912	268	865973-905	372
827700-901	244, 329	835975-912	267	860975-914	268	865973-906	372
827700-902	244, 269	835975-914	267	861600-902	269	865973-909	372
827700-905	244, 269	840140-901	261, 269, 273, 283, 329-330, 372, 433	861600-906	269	8660-0827	108
827700-906	244, 269			861608-901	282	866668-901	281
827700-912	244, 269	840300-908	330	861630-902	372, 463	866735-902	268
827700-914	244, 269	843300-908	330	861700-901	282	866953-302	267
827768-901	244, 282	846952-704	334	861753-902	268	866953-902	267
827975-301	244, 329	846975-202	267	861753-905	268	866953-905	267
827975-302	244, 268	846975-902	267	861753-906	268	866953-906	267
827975-305	244, 268	846975-906	267	861753-912	268	866953-912	267
827975-306	244, 268	846975-914	267	861753-914	268	866953-914	267
827975-312	244, 268	8500-1867	107	861767-902	273	866967-902	273
827975-314	244, 268	8500-2236	107	861768-901	282	868050-901	282, 318
827975-901	244	8500-4410	195	861775-902	372	868100-901	282, 318
827975-902	244, 267, 329	8500-6762	15	861775-906	372	868150-901	282, 318
827975-905	244, 267	8500-6782	196	861953-902	267	870050-902	269, 317
827975-906	244, 267	8500-6785	174	861953-905	267	870050-906	269, 317
827975-912	244, 267	8500-6786	197	861953-906	267	870050-914	269, 317
827975-914	244, 267	8500-6787	197	861953-912	267	870100-902	269, 317
828668-301	244, 281	8500-6797	172	861953-914	267	870100-906	269, 317
828668-901	244, 281	8500-6900	174	861954-302	267	870100-914	269, 317
828700-901	244, 329	8500-6917	110	861954-305	267	870150-902	269, 317
828700-902	244, 269	857700-302	238, 268	861954-306	267	870150-906	269, 317
828700-905	244, 269	857700-305	238, 268	861954-309	267	870150-914	269, 317
828700-906	244, 269	857700-306	238, 268	861954-312	267	8710-0004	108
828700-912	244, 269	857700-312	238, 268	861954-314	267	8710-0510	99, 108
828700-914	244, 269	857700-314	238	861967-302	273	8710-0806	108
828768-901	244, 282	857700-902	238, 268	861967-902	273	8710-1534	95
828975-301	244, 329	857700-905	238, 268	861971-901	281	8710-1615	108
828975-302	244, 268	857700-906	238, 268	861973-306	372	8710-1622	108
828975-305	244, 268	857700-912	238, 268	861973-902	372	8710-1924	11, 48
828975-306	244, 268	857700-914	238	861973-906	372	8710-1930	11, 35, 58, 108
828975-309	244, 268	857750-902	372	863600-902	269	8710-1931	11, 35
828975-312	244, 268	857750-906	372	863600-905	269	8710-2699	108
828975-314	244, 268	857750-909	372	863600-906	269	871700-902	268
828975-901	244, 329	857750-944	372, 375	863608-901	282	871700-906	268
828975-902	244, 267	857768-901	238, 281	863630-902	372, 463	871700-914	268
828975-905	244, 267	858700-302	238, 268	863630-906	372, 463	872700-902	268
828975-906	244, 267	858700-305	238, 268	863668-301	281	872700-906	268
828975-912	244, 267	858700-306	238, 268	863668-901	281	873700-902	270
828975-914	244, 267	858700-312	268	863700-901	282	873700-906	270

## PART NUMBER INDEX

873700-932	270	880995-206	372	895150-909	317, 373, 466	933975-902	262
873700-936	270	880995-209	372	897150-102	317, 373, 466	933975-906	262
874700-902	268	880995-902	372	897150-106	317, 373, 466	933975-932	262
874700-906	268	880995-905	372	897150-109	317, 373, 466	933975-936	262
875700-902	270	880995-906	372	897250-102	317, 373, 466	934967-902	260
875700-906	270	880995-909	372	897250-105	317, 373, 466	934967-906	260
875700-932	270	881750-902	372	897250-106	317, 373, 466	935967-902	260
875700-936	270	883668-301	281	897250-109	317, 373, 466	935967-906	260
877150-102	269, 317	883668-901	281	921700-902	245, 263	935967-912	260
877150-106	269, 317	883700-704	334	921700-932	245, 263	946975-902	260
877150-114	269, 317	883700-714	334	921975-902	245, 263	946975-906	260
877250-101	318, 329	883700-901	329	921975-932	245, 263	959701-902	253
877250-102	269, 317	883700-902	273	922700-902	245, 262	959701-906	253
877250-105	269, 317	883700-905	268	922700-932	245, 262	959701-912	253
877250-106	269, 317	883700-906	268	922975-902	243, 245, 262	959701-918	253, 255
877250-112	269, 317	883700-909	268	922975-906	245, 262	959731-902	243, 253
877250-114	269, 317	883700-912	268	922975-932	245, 262	959731-906	243, 253
877952-101	317, 330	883700-922	268	923700-902	245, 263	959731-912	243, 253
877952-102	283, 317	883725-901	281	923700-932	245, 263	959733-902	253
877952-105	283, 317, 330	883750-902	372	923975-902	245, 262	959733-906	253
877952-106	283, 317	883750-905	372	923975-932	245, 262	959733-912	253
877952-108	317, 330	883750-906	372	924700-902	243, 261	959741-902	243, 253
877967-102	273, 318	883750-909	372	924700-906	243, 261	959741-906	243, 253
877974-901	433	883952-302	283	924975-302	243, 260	959741-912	243, 253
877974-910	433	883952-701	330	924975-306	243, 260	959741-918	243, 253, 255
878150-101	282, 318	883952-702	283	924975-902	243, 260	959743-901	325
878250-101	282, 318	883952-703	334	924975-906	243, 260	959743-902	253
880668-301	281	883952-704	334	925700-902	245, 263	959743-906	253
880668-901	281	883952-705	330	925700-932	245, 263	959743-912	253
880952-201	330	883952-706	283	925975-902	245, 262	959746-902	253
880952-202	283	883952-708	330	925975-932	245, 262	959746-906	253
880952-203	334	883952-710	283	926700-902	243, 261	959757-301	238, 325
880952-204	334	883952-712	283	926700-906	243, 261	959757-302	238, 252
880952-205	330	883952-714	334	926975-302	243, 260	959757-306	238, 252
880952-206	283	883967-302	273	926975-306	243, 260	959757-312	238
880952-208	330	883967-901	273	926975-902	243, 260	959757-901	238, 325
880952-302	283	883967-902	273	926975-906	243, 260	959757-902	210, 238, 253
880952-701	330	883975-202	267	927700-902	243, 261	959757-906	238, 253
880952-702	283	883975-302	267	927700-906	243, 261	959757-912	238
880952-703	334	883975-305	267	927975-302	243, 260	959758-301	238, 325
880952-704	334	883975-306	267	927975-306	243, 260	959758-302	238, 252
880952-705	330	883975-309	267	927975-902	243, 260	959758-306	238, 252
880952-706	283	883975-312	267	927975-906	243, 260	959758-312	238
880952-708	330	883975-314	267	928700-902	243, 261	959758-901	238, 325
880952-710	283	883975-901	329	928700-906	243, 261	959758-902	238, 253
880952-712	283	883975-902	267	928975-302	243, 260	959758-906	238, 253
880952-714	334	883975-905	267	928975-306	260	959758-912	238
880967-201	267, 273	883975-906	267	928975-902	243, 260	959759-302	238, 252
880967-202	273	883975-909	267	928975-906	260	959759-306	238, 252
880967-302	273	883975-912	267	9300-1747	199	959759-901	238, 325
880967-901	273	883975-914	267	9300-1748	199	959759-902	238, 253
880967-902	273	883995-902	210, 372	9301-0407	99	959759-906	238, 253
880975-201	329	883995-905	372	9301-0656	53	959759-912	238
880975-202	267	883995-906	372	9301-0722	200	959763-902	253
880975-205	267	883995-909	372	9301-0895	13	959763-906	253
880975-209	267	884950-507	283	9301-0978	199	959763-912	253
880975-212	267	884950-526	283	9301-1291	106	959764-902	243, 253
880975-302	267	884950-543	283	9301-1337	58	959764-906	243, 253
880975-305	267	884950-567	267	9301-1420	53	959764-912	243, 253
880975-306	267	884950-577	281	9301-1421	53	959764-918	243, 253, 255
880975-309	267	884973-701	433	9301-1446	99	959790-918	253, 255
880975-312	267	884973-901	433	9301-1450	53	959793-901	325
880975-314	267	884973-902	433	9301-6341	53	959793-902	253
880975-901	329	884975-202	267	9301-6342	53	959793-906	253
880975-902	267	895050-902	317, 373, 466	930990-902	260	959793-912	253
880975-905	267	895050-906	317, 373, 466	930990-906	260	959793-918	253, 255
880975-906	267	895050-909	317, 373, 466	931975-902	262	959794-902	243
880975-909	267	895100-902	317, 373, 466	931975-906	262	959931-902	243, 252
880975-912	267	895100-906	317, 373, 466	931975-932	262	959931-906	243, 252
880975-914	267	895100-909	317, 373, 466	931975-936	262	959931-912	243, 252
880995-202	372	895150-902	317, 373, 466	932967-902	260	959931-918	243, 252, 255
880995-205	372	895150-906	317, 373, 466	932967-906	260	959933-902	252

959933-906	252	961967-905	260	993967-905	260, 329	A2001150X046	300
959933-912	252	961967-906	260	993967-906	260	A2001200X030	301
959936-902	252	963400-902	394	993967-912	260	A2001250C046	302
959936-906	252	963600-902	261	A2000020X020	301	A2001250X020	301
959936-912	252	963600-906	261	A2000030X020	301	A2001250X030	301
959941-302	243, 252	963954-302	260	A2000030X046	300	A2001250X046	300
959941-306	243, 252	963954-305	260	A2000050X020	301	A2001MG	303
959941-312	243, 252	963954-306	260	A2000050X030	301	A2001MG1	303
959941-902	243, 252	963954-312	260	A2000050X046	300	A2002250X046	300
959941-906	243, 252	963967-902	260	A2000100C020	302	A2002250X212	300, 321
959941-912	243, 252	963967-905	260	A2000100C030	302	A2002250X500	300
959941-918	243, 252, 255	963967-906	260	A2000100C046	302	A2002MG	303
959943-901	325	963967-912	260	A2000100R030	302	A2003020X020	301, 332
959943-902	252	965600-902	261	A2000100R046	302	A2003030X020	301, 332
959943-906	252	965600-906	261	A2000100T030	302	A2003050X020	301, 332
959943-912	252	966400-902	394	A2000100T046	302	A2003050X030	301, 332
959943-918	252, 255	966735-902	261	A2000100X020	301	A2003050X046	300, 332
959946-902	252	966954-302	260	A2000150X030	301	A2003100X212	300, 331
959946-906	252	966967-902	260	A2000100X046	300	A2003100X020	301, 332
959951-902	243, 252	966967-905	260	A2000100X212	300	A2003100X030	301, 332
959961-302	252	966967-906	260	A2000100X300	300	A2003100X046	300, 332
959961-306	252	966967-912	260	A2000125X040	301	A2003125X040	301, 332
959961-312	252	970050-902	261, 318	A2000150C046	302	A2003150X020	301, 332
959961-901	325	970050-906	261, 318	A2000150R030	302	A2003150X030	301, 332
959961-902	252	970100-902	261, 318	A2000150R046	302	A2003150X040	301, 332
959961-906	252	970100-906	261, 318	A2000150T030	302	A2003150X046	300, 331-332
959961-912	252	970150-902	261, 318	A2000150T046	302	A2003250X020	301, 332
959961-918	252, 255	970150-906	261, 318	A2000150X020	301	A2003250X030	301, 332
959963-302	252	971700-902	261	A2000150X030	301	A2003250X040	301, 332
959963-306	252	971700-906	261	A2000150X040	301	A2003250X046	300, 332
959963-312	252	972700-902	261	A2000150X046	300	A2003250X212	300, 321, 331
959963-902	210, 252	972700-906	261	A2000150X212	300	A2003MG	303, 332
959963-906	252	973700-902	262	A2000200X046	300	A2003MG2	303, 332
959963-912	252	973700-906	262	A2000250C030	302	A2004250X212	300, 321, 331
959963-918	252, 255	973700-932	262	A2000250C046	302	A2004250X500	300, 331
959964-302	243, 252	973700-936	262	A2000250R046	302	A2004MG	303, 332
959964-306	243, 252	974700-902	261	A2000250T046	302	A2004MG2	303, 332
959964-312	243, 252	974700-906	261	A2000250X020	301	A2005020X020	301, 332
959964-902	243, 252	975700-902	262	A2000250X030	301	A2005030X020	301, 332
959964-906	243, 252	975700-906	262	A2000250X040	301	A2005050X020	301, 332
959964-912	243, 252	975700-932	262	A2000250X046	300	A2005050X030	301, 332
959964-918	243, 252, 255	975700-936	262	A2000250X100	300, 321	A2005050X046	301, 332
959990-318	252, 255	977150-102	261, 318	A2000250X212	300, 321	A2005100X020	301, 332
959990-902	252	977150-106	261, 318	A2000MG	303	A2005100X030	301, 332
959990-906	252	977250-102	261, 318	A2000MG2	303	A2005100X046	300, 332
959990-912	252	977250-106	261, 318	A2001020X020	301	A2005150X020	301, 332
959990-918	252, 255	981757-302	238, 260	A2001030X020	301	A2005150X030	301, 332
959993-302	252	981757-902	238, 261	A2001030X030	301	A2005150X046	300, 332
959993-306	252	981758-302	238, 260	A2001030X046	301	A2005250X020	301, 332
959993-902	252	981758-902	238, 261	A2001050C020	302	A2005250X046	300-301, 332
959993-906	252	981759-302	238, 260	A2001050R020	302	A2005MG	303, 332
959993-912	252	981759-902	238, 261	A2001050T020	302	A2005MG2	303, 332
959993-918	252, 255	990967-202	260	A2001050X020	301	A2006030X020	301
959994-902	243	990967-206	260	A2001050X030	301	A2006050X020	301
959996-902	252	990967-302	260	A2001050X046	301	A2006050X046	300
959996-906	252	990967-305	260	A2001075X046	300	A2006100X020	301
959996-912	252	990967-306	260	A2001100C020	302	A2006100X030	301
959996-918	252, 255	990967-312	260	A2001100R030	302	A2006100X046	300
960967-902	260	990967-902	260	A2001100R046	302	A2006150X020	301
960967-905	260	990967-905	260, 329	A2001100T030	302	A2006150X030	301
960967-906	260	990967-906	260	A2001100T046	302	A2006150X046	300
960967-912	260	990967-912	260	A2001100X020	301	A2006250X020	301
961400-302	394	993400-902	394	A2001100X030	301	A2006250X030	301
961600-902	261	993700-902	260	A2001100X046	300	A2006250X046	300
961600-906	261	993700-905	260, 329	A2001150C020	302	A2006250X100	300, 321
961753-902	261	993700-906	260	A2001150C046	302	A2006250X212	300
961753-905	261	993700-912	260	A2001150R020	302	A2006MG	303
961753-906	261	993967-302	260	A2001150R046	302	A2006MG2	303
961967-302	260	993967-305	260	A2001150T020	302	A2007030X020	301
961967-306	260	993967-306	260	A2001150T046	302	A2007030X030	300
961967-312	260	993967-312	260	A2001150X020	301	A2007050X020	301
961967-902	260	993967-902	260	A2001150X030	301	A2007050X030	301

## PART NUMBER INDEX

A2007050X046	301	A2014250X046	300, 332	A3000150T046	294	A3030250X046	291
A2007100X020	301	A2014MG	303, 332	A3000150X020	292	A3030250X100	291, 320
A2007100X030	301	A2014MG2	303, 332	A3000150X030	291	A3030MG	294
A2007100X046	300	A2020050X020	301	A3000150X039	291	A3030MG2	294
A2007150X020	301	A2020050X046	300	A3000150X046	291	A3031030X020	292
A2007150X030	301	A2020100X030	301	A3000150X100	291	A3031050R020	294
A2007150X046	300	A2020125X040	301	A3000150X212	292	A3031050T020	294
A2007250X020	301	A2020150X020	301	A3000250C020	293	A3031050X020	292
A2007250X030	301	A2020150X030	301	A3000250C030	293	A3031100C046	293
A2007250X046	300	A2020150X040	301	A3000250C046	293	A3031100X020	292
A2007MG	303	A2020150X046	300	A3000250X020	292	A3031100X046	291
A2007MG2	303	A2020250X020	301	A3000250X030	291	A3031150C046	293
A2008250X100	300	A2020250X030	301	A3000250X040	291	A3031150R046	294
A2008250X212	300	A2020250X040	301	A3000250X046	291	A3031150T046	294
A2008MG	303	A2020250X046	300	A3000250X100	291, 320	A3031150X020	292
A2010050X020	301	A2020250X100	300, 321	A3000250X212	292	A3031150X046	291
A2010100X030	301	A2020250X212	300	A3000300X039	291	A3031250C046	293
A2010100X046	300	A2020MG	303	A3000MG	294	A3031250X046	291
A2010125X040	301	A2020MG2	303	A3000MG1	294	A3031MG	294
A2010150X020	301	A2021050X020	301	A3000MG2	294	A3031MG2	294
A2010150X030	301	A2021050X030	301	A3001020X020	292	A3032100X046	291
A2010150X040	301	A2021050X046	301	A3001030X020	292	A3032150X046	291
A2010150X046	300	A2021050X100	300	A3001030X046	291	A3032250X046	291
A2010250X030	301	A2021075X020	301	A3001050C020	293	A3032250X100	291, 320
A2010250X040	301	A2021100X020	301	A3001050C046	293	A3032250X212	292, 320
A2010250X046	300	A2021150X020	301	A3001050R046	294	A3032250X500	292
A2010250X100	321	A2021150X030	301	A3001050T046	294	A3040030X020	292
A2010250X212	300, 321	A2021250X020	301	A3001050X020	292	A3040050X020	292
A2010MG	303	A2021250X046	300	A3001050X030	292	A3040050X046	291
A2010MG2	303	A2021MG	303	A3001050X046	291	A3040100X020	292
A2011030X030	301	A2021MG2	303	A3001100C020	293	A3040100X046	291
A2011050X020	301	A2030050X020	301	A3001100C030	293	A3040100X212	292
A2011075X046	300	A2030100X030	301	A3001100C046	293	A3040150X020	292
A2011100X046	300	A2030125X040	301	A3001100R030	294	A3040150X030	291
A2011150X020	301	A2030150X020	301	A3001100T030	294	A3040150X046	291
A2011150X046	300	A2030150X030	301	A3001100X020	292	A3040250X030	291
A2011250X020	301	A2030150X040	301	A3001100X030	291	A3040250X046	291
A2011MG	303	A2030150X046	300	A3001100X046	291	A3040250X100	320
A2011MG2	303	A2030250X020	301	A3001150C020	293	A3040MG	294
A2013020X020	301, 332	A2030250X030	301	A3001150C030	293	A3040MG1	294
A2013030X020	301, 332	A2030250X040	301	A3001150C046	293	A3040MG2	294
A2013050X020	301, 332	A2030250X046	300	A3001150R030	294	A3041020X020	292
A2013050X046	300, 332	A2030250X100	300, 321	A3001150T030	294	A3041030X020	292
A2013100X020	301, 332	A2030250X212	300, 321	A3001150X020	292	A3041050X020	292
A2013100X030	301, 332	A2030MG	303	A3001150X030	291	A3041050X030	292
A2013100X046	300, 332	A2031050X020	301	A3001150X046	291	A3041050X046	291
A2013125X040	301, 332	A2031050X030	301	A3001250X020	292	A3041100X020	292
A2013150X020	301, 332	A2031050X046	301	A3001250X030	291	A3041100X030	291
A2013150X030	301, 332	A2031100X020	301	A3001250X046	291	A3041150X046	291
A2013150X040	301, 332	A2031150X020	301	A3001MG	294	A3041150X020	292
A2013150X046	300, 332	A2031250X020	301	A3001MG2	294	A3041150X030	291
A2013250X020	301, 332	A2031250X046	300	A3002100X046	291	A3041150X046	291
A2013250X030	301, 332	A2031MG2	303	A3002150X046	291	A3041200X020	292
A2013250X040	301, 332	A3000020X020	292	A3002150X212	292	A3041250X020	292
A2013250X046	300, 332	A3000030X020	292	A3002250X046	291	A3041250X046	291
A2013250X100	300, 321, 331	A3000050X020	292	A3002250X100	291	A3041MG	294
A2013250X212	300, 321, 331	A3000050X046	291	A3002250X212	292	A3041MG1	294
A2013MG	303, 332	A3000100C020	293	A3002250X500	292	A3041MG2	294
A2013MG2	303, 332	A3000100C030	293	A3002300X039	291	A3050020X020	292
A2014020X020	301, 332	A3000100C046	293	A3002MG	294	A3050030X020	292
A2014030X020	301, 332	A3000100R030	294	A3002MG2	294	A3050050X020	292
A2014050X020	301, 332	A3000100T030	294	A3030050X020	292	A3050050X046	291
A2014050X030	301, 332	A3000100X020	292	A3030100C046	293	A3050100X020	292
A2014050X046	301, 332	A3000100X030	291	A3030100X020	292	A3050100X030	291
A2014100X020	301, 332	A3000100X046	291	A3030100X046	291	A3050100X046	291
A2014100X030	301, 332	A3000125X040	291	A3030150C020	293	A3050150X030	291
A2014100X046	300, 332	A3000150C020	293	A3030150C046	293	A3050150X046	291
A2014150X020	301, 332	A3000150C030	293	A3030150R046	294	A3050150X100	291
A2014150X030	301, 332	A3000150C046	293	A3030150T046	294	A3050150X212	292
A2014150X046	300, 332	A3000150R030	294	A3030150X020	292	A3050250X046	291
A2014250X020	301, 332	A3000150R046	294	A3030150X046	291	A3050250X100	291, 320
A2014250X030	301, 332	A3000150T030	294	A3030250C046	293	A3050250X212	292

A3050MG	294	A6004250X212	296, 320, 331	A7000100R030	294	G1313-27302	65
A3050MG2	294	A6004250X300	296, 320, 331	A7000100T030	294	G1313-43204	63
A3051020X020	292	A6004250X500	296, 320, 331	A7000150C046	293	G1313-43216	35
A3051030X020	292	A6004MG	297	A7000150R046	294	G1313-44510	65
A3051050X020	292	A6005050X020	296, 331	A7000150T046	294	G1313-44512	65
A3051050X030	292	A6005050X046	295, 331	A7000150X046	291	G1313-44513	65
A3051050X046	291	A6005100X046	295, 331	A7000250C046	293	G1313-60004	65
A3051100X020	292	A6006050X046	295, 331	A7000250R046	294	G1313-68709	66
A3051100X030	291	A6006100X021	296, 331	A7000250T046	294	G1313-68711	67
A3051100X046	291	A6006100X046	295, 331	A7000250X046	291	G1313-68719	66
A3051150X020	292	A6010050X020	296	A7000MG3	297	G1313-68730	66
A3051150X030	291	A6010100X020	296	A7001100C046	293	G1313-87102	62
A3051150X046	291	A6010100X030	295	A7001100R030	294	G1313-87201	62
A3051250X046	291	A6010100X046	295	A7001100R046	294	G1313-87202	62
A3051MG	294	A6010100X212	320	A7001100T030	294	G1313-87203	62
A3051MG2	294	A6010150X020	296	A7001100T046	294	G1313-87300	34
A6000030X020	296	A6010150X030	295	A7001100X020	292	G1313-87303	32, 64
A6000030X212	296	A6010150X040	295	A7001100X030	291	G1313-87304	23, 82
A6000050X020	296	A6010150X046	295	A7001100X046	291	G1313-87305	23, 33, 82
A6000050X046	295	A6010150X212	320	A7001150C046	293	G1314-60081	91-92
A6000050X100	295	A6010250X030	295	A7001150R046	294	G1314-60082	91-92
A6000050X212	296, 320	A6010250X040	295	A7001150T046	294	G1314-60083	91-92
A6000050X300	296	A6010250X046	295	A7001MG3	297	G1314-60086	91-92
A6000100X020	296	A6010250X300	320	A7501030X020	297	G1314-60087	91-92
A6000100X030	295	A6010MG	297	A7501050X020	297	G1314-60100	90
A6000100X046	295	A6010MG2	297	A7501100X020	297	G1314-60101	90
A6000100X212	296, 320	A6011050X020	296	A7501100X030	297	G1314-60182	91-92
A6000100X300	296, 320	A6011050X030	295	A7501150X020	297	G1314-60183	91-92
A6000150X020	296	A6011050X046	295	A7501150X030	297	G1314-60186	91-92
A6000150X030	295	A6011100X020	296	A7511030X020	297	G1314-60187	91-92
A6000150X040	295	A6011100X030	295	A7511050X020	297	G1314-65052	91, 97
A6000150X046	295	A6011100X046	295	A7511100X020	297	G1314-65054	91, 97
A6000150X100	295	A6011150X020	296	A7511150X030	297	G1314-65056	97
A6000150X212	296, 320	A6011150X030	295	A7521030X020	297	G1314-65061	91, 97
A6000150X300	296, 320	A6011MG	297	A7521050X020	297	G1314-87301	92
A6000250X020	296	A6011MG2	297	A7521100X020	297	G1314-87302	92
A6000250X030	295	A6012250X212	296	BHT-4	104, 108	G1315-27705	96
A6000250X040	295	A6020050X020	296	BMT-4	108	G1315-45003	11, 95
A6000250X046	295	A6020050X046	295	G1103-60001	90	G1315-60011	94-95
A6000250X100	295	A6020100X030	295	G1156-68711	83	G1315-60012	94-95
A6000250X212	296, 320	A6020100X046	295	G1156-68712	83	G1315-60015	94-95
A6000250X300	296, 320	A6020100X212	296, 320	G1156-68713	83	G1315-60016	94, 96
A6000MG	297	A6020150X020	296	G1156-68714	83	G1315-60017	94, 96
A6000MG2	297	A6020150X030	295	G1160-68706	83	G1315-60018	94, 96
A6001020X020	296	A6020150X046	295	G1310-68730	59	G1315-60022	94-95
A6001030X030	295	A6020150X300	296	G1310-68731	59	G1315-60024	94-95
A6001030X046	295	A6020250X020	296	G1310-68741	59	G1315-60025	94-95
A6001050X020	296	A6020250X030	295	G1310-68742	59	G1315-67301	96
A6001050X030	295	A6020250X046	295	G1311-60003	53	G1315-67302	96
A6001050X046	295	A6020250X100	295	G1311-60006	12	G1315-68703	31
A6001100X010	296	A6020250X212	296, 320	G1311-60009	48	G1315-68708	31-32
A6001100X020	296	A6020MG	297	G1311-68705	60	G1315-68712	97
A6001100X030	295	A6020MG2	297	G1311-68710	59	G1315-68713	91, 97
A6001100X046	295	A6021030X020	296	G1311-68711	59	G1315-68715	96-97
A6001150X010	296	A6021030X046	295	G1312-60020	49	G1315-68716	94, 96
A6001150X020	296	A6021050X020	296	G1312-60025	49	G1315-68724	94, 96
A6001150X030	295	A6021050X030	295	G1312-60061	48	G1315-68725	96-97
A6001150X046	295	A6021050X046	295	G1312-60066	49	G1315-80001	96
A6001250X020	296	A6021100X010	296	G1312-60067	49	G1315-80002	96
A6001250X046	295	A6021100X020	296	G1312-67305	23	G1315-80003	96
A6001MG	297	A6021100X030	295	G1312-67500	23	G1315-80004	96
A6001MG2	297	A6021100X046	295	G1312-68711	59	G1315-87101	96
A6002050X046S	295	A6021150X020	296	G1312-68716	53	G1315-87302	95
A6002150X300	320	A6021150X030	295	G1312-68726	60	G1315-87303	23
A6002250X046	295	A6021150X046	295	G1312-68730	60	G1315-87305	96
A6002250X100	295, 320	A6021150X100	295	G1312-68741	59	G1315-87306	95
A6002250X212	296, 320	A6021250X020	296	G1312-68755	60	G1315-87311	23, 33, 92, 99
A6002250X300	320	A6021250X046	295	G1312-87303	23	G1315-87312	23
A6002250X500	296, 320	A6021MG	297	G1312-87304	23	G1315-87313	96
A6002MG	297	A6021MG2	297	G1312-87305	28	G1315-87318	96
A6004250X046	295, 331	A6022250X500	320	G1312-87306	28	G1315-87319	95
A6004250X100	295, 331	A7000100C030	293	G1312-87330	54	G1315-87321	95

## PART NUMBER INDEX

G1315-87323.....	96	G1364-68723.....	70	G1600-60211.....	178	G1947-20029.....	105
G1315-87325.....	95	G1364-81701.....	71	G1600-60230.....	190	G1947-60103.....	105
G1315-87328.....	96	G1364-83205.....	71	G1600-60232.....	180	G1956-20302.....	106
G1315-87333.....	96	G1364-84516.....	69	G1600-60233.....	180	G1956-80000.....	106
G1315-87338.....	96	G1364-84521.....	69	G1600-60310.....	190	G1958-60098.....	105
G1315-87339.....	95	G1364-84522.....	69	G1600-60311.....	178	G1958-60136.....	105
G1316-27301.....	28	G1364-84523.....	69	G1600-60330.....	190	G1960-80039.....	107
G1316-60001.....	82	G1364-84524.....	69	G1600-60332.....	180	G1960-80060.....	105
G1316-67005.....	75	G1364-84525.....	69	G1600-60400.....	194	G1969-20302.....	106
G1316-67006.....	75	G1364-84531.....	69	G1600-60411.....	178	G1969-60086.....	108
G1316-67007.....	75	G1364-84532.....	69	G1600-60419.....	184	G1969-85000.....	110
G1316-67009.....	75	G1364-86711.....	71	G1600-61132.....	180	G1969-85001.....	107
G1316-68708.....	83	G1364-87201.....	70	G1600-61211.....	178	G1969-85003.....	15, 107
G1316-68710.....	83	G1364-87202.....	70	G1600-61219.....	184	G1969-85010.....	110
G1316-68711.....	83	G1364-87304.....	70-71	G1600-61232.....	173, 180	G1969-85020.....	110
G1316-68716.....	38, 82	G1364-87305.....	70-71	G1600-61239.....	184	G1969-85026.....	107
G1316-68721.....	83	G1364-87306.....	70-71	G1600-61311.....	178	G1972-60025.....	71
G1316-68744.....	82	G1367-60001.....	69	G1600-61332.....	180	G1978-85000.....	15, 107
G1316-80002.....	82	G1367-68730.....	66	G1600-61411.....	178	G1982-85001.....	15
G1316-80003.....	82	G1367-68734.....	66	G1600-61419.....	184	G1982-85002.....	15
G1316-80004.....	82	G1367-68741.....	66	G1600-62132.....	180	G1982-85003.....	15
G1316-83200.....	82	G1367-87012.....	63	G1600-62211.....	172, 178	G2228-68700.....	59
G1316-87300.....	23, 33, 82	G1367-87017.....	63	G1600-62232.....	180	G2250-04500.....	65
G1316-87303.....	27, 82	G1367-87101.....	62	G1600-62311.....	174, 178	G2250-04501.....	65
G1316-87305.....	27	G1367-87102.....	62	G1600-62318.....	185	G2250-04502.....	65
G1316-87306.....	28	G1367-87200.....	62, 70	G1600-62332.....	180	G2250-04503.....	65
G1316-87309.....	23	G1367-87201.....	62	G1600-62402.....	199	G2250-04504.....	65
G1316-87312.....	27	G1367-87202.....	63	G1600-62411.....	178	G2255-68700.....	65, 69
G1316-87313.....	27	G1367-87300.....	32, 64	G1600-62700.....	190	G2255-68709.....	65
G1316-87314.....	27	G1367-87304.....	28	G1600-63200.....	192	G2255-68710.....	65
G1316-87316.....	27	G1375-87301.....	31	G1600-63211.....	178	G2255-68720.....	65
G1316-87317.....	27	G1375-87302.....	31	G1600-63311.....	178	G2255-68730.....	65
G1316-87318.....	27	G1375-87303.....	32, 64	G1600-63411.....	178	G2258-23201.....	54
G1316-87319.....	27	G1375-87304.....	31	G1600-64211.....	175, 178	G2258-60003.....	64
G1316-87321.....	28	G1375-87305.....	32	G1600-64232.....	180	G2258-60011.....	65
G1316-87323.....	28	G1375-87306.....	32	G1600-64311.....	178	G2258-68710.....	63
G1321-60005.....	99	G1375-87308.....	32	G1600-64332.....	180	G2258-87102.....	63
G1321-60007.....	99	G1375-87309.....	31-32	G1600-64411.....	178	G2258-87307.....	34
G1321-60015.....	99	G1375-87310.....	31	G1600-67201.....	199	G2258-87310.....	34
G1322-67300.....	58	G1375-87311.....	32	G1600-67219.....	184, 195	G2258-87311.....	34
G1322-68705.....	58, 60	G1375-87312.....	32	G1600-67220.....	195	G2258-87312.....	34
G1328-87600.....	23	G1375-87315.....	32, 64	G1600-67311.....	194-195	G2258-87313.....	34
G1329-60011.....	65	G1375-87320.....	31	G1600-67312.....	195	G2258-87314.....	34
G1329-68718.....	67	G1375-87321.....	31	G1600-67319.....	184, 195	G2258-87315.....	34
G1329-68727.....	67	G1375-87322.....	31	G1600-68319.....	184, 192	G2258-87316.....	34
G1329-68736.....	67	G1375-87323.....	31	G1600-68714.....	192	G2260-68711.....	32, 64
G1329-68737.....	67	G1375-87324.....	31	G1600-68715.....	192	G2260-87101.....	63
G1329-80001.....	62	G1375-87325.....	31	G1600-68716.....	192	G2260-87201.....	63
G1329-87012.....	62	G1375-87326.....	34	G1600-68723.....	192	G2260-87300.....	26
G1329-87017.....	62	G1375-87327.....	31	G1603A.....	194	G2260-87301.....	26
G1329-87101.....	62	G1376-60003.....	53	G1607-20030.....	195	G2421-60001.....	110
G1329-87103.....	62	G1376-60005.....	59	G1607-60000.....	195	G2423A.....	107
G1329-87300.....	23	G1376-68705.....	60	G1607-60001.....	195	G2424A.....	107
G1329-87302.....	32, 64	G1376-68707.....	60	G1607-60041.....	195	G2425A.....	107
G1353-68750.....	75	G1376-68710.....	60	G1607A.....	195	G2426A.....	107
G1361-22402.....	50	G1377-44900.....	63	G160U-60419.....	184	G2427A.....	105
G1361-23204.....	54	G1377-87000.....	63	G160U-61219.....	184	G2428A.....	105
G1361-23205.....	54	G1377-87001.....	63	G160U-61239.....	184	G2431A.....	110
G1361-60012.....	49	G1377-87002.....	63	G160U-61419.....	184	G2432A.....	110
G1361-60022.....	53	G1377-87201.....	63	G1946-00034.....	107	G2441-80010.....	106
G1361-67302.....	26	G1377-87300.....	32, 64	G1946-20215.....	108	G2453-85050.....	107
G1361-68707.....	60	G1377-87310.....	32, 64	G1946-20301.....	105	G2453-85060.....	107
G1361-68710.....	60	G1379-67310.....	58	G1946-60037.....	105	G2455-85001.....	15
G1362-68706.....	98	G1600-23223.....	199	G1946-60098.....	105	G2571-80103.....	106
G1362-68709.....	98	G1600-60002.....	190	G1946-60157.....	108	G3199B.....	109
G1362-87300.....	98	G1600-60007.....	199	G1946-60180.....	108	G4203-68708.....	11
G1362-87301.....	98	G1600-60013.....	194	G1946-80009.....	105	G4204-40000.....	51
G1364-27107.....	71	G1600-60027.....	192	G1946-80019.....	106	G4204-40005.....	51
G1364-60021.....	71	G1600-60033.....	199	G1946-80049.....	108	G4204-60004.....	51
G1364-68706.....	71	G1600-60132.....	180	G1946-80054.....	108	G4204-60022.....	49
G1364-68711.....	70	G1600-60150.....	190	G1946-85004.....	107	G4208-68700.....	11
G1364-68712.....	70	G1600-60210.....	190	G1946-85021.....	107	G4212-60007.....	94

G4212-60008.....	94	G5611-67300.....	30	PL1110-6320.....	505	PL1210-6120.....	506
G4212-60011.....	94	G5611-67301.....	30	PL1110-6400.....	508	PL1210-6120EPA.....	507
G4212-60022.....	51	G5611-68710.....	37	PL1110-6500.....	500	PL1210-6125.....	506
G4212-60032.....	94	G5611-68741.....	59, 101	PL1110-6504.....	500	PL1210-6130.....	506
G4212-60038.....	94	G5615-60005.....	102	PL1110-6515.....	505	PL1210-6140.....	506
G4212-68001.....	51	G5615-60017.....	102	PL1110-6520.....	505	PL1210-6150.....	506
G4216-68711.....	67	G5615-60018.....	102	PL1110-6525.....	505	PL1210-6160.....	506
G4218-20000.....	98	G5615-60022.....	102	PL1110-6530.....	505	PL1212-1102.....	470
G4218-20001.....	98	G5616-60050.....	30, 102	PL1110-6540.....	505	PL1212-1103.....	470
G4218-20002.....	98	G5664-86703.....	102	PL1110-6550.....	505	PL1212-3100.....	470
G4218-20003.....	98	G5664-86706.....	102	PL1111-3500.....	310, 393	PL1212-3101.....	470
G4218-20004.....	98	G5667-40500.....	102	PL1113-1300.....	518	PL1212-3702.....	470
G4218-40000.....	98	G5667-60310.....	32	PL1113-1320.....	521	PL1212-3703.....	470
G4218-40010.....	98	G5667-60320.....	64, 102	PL1113-1325.....	520	PL1212-3800.....	470
G4218-40011.....	98	G5667-60500.....	30	PL1113-1500.....	516	PL1212-3801.....	470
G4218-40100.....	98	G5667-60501.....	30	PL1113-3100.....	511	PL1212-6100.....	470
G4218-40110.....	98	G5667-60502.....	30	PL1113-3120.....	511	PL1212-6101.....	470
G4218-40130.....	98	G5667-60503.....	30	PL1113-3300.....	511	PL1212-6200.....	470
G4218-40150.....	98	G5667-60504.....	30	PL1113-3500.....	511	PL1212-6201.....	470
G4218-40220.....	98	G5667-60505.....	30	PL1113-6300.....	518	PL1212-6400.....	470
G4218-60100.....	98	G5667-87017.....	63, 102	PL1113-6325.....	520	PL1212-6401.....	470
G4218-68010.....	98	G5667-87200.....	63, 101	PL1113-6500.....	516	PL1212-6800.....	470
G4218-85000.....	15, 98	G6011A.....	109	PL1113-6520.....	521	PL1212-6801.....	470
G4220-20012.....	11	G6012A.....	109	PL1114-1900HFIP.....	509	PL1213-6520.....	521
G4220-24013.....	52	G6013A.....	109	PL1114-6900HFIP.....	509	PL1220-6130.....	528
G4220-26210.....	52	G6014A.....	109	PL1117-1800.....	512	PL1245-1102.....	474
G4220-60006.....	51	G7100-60002.....	190	PL1117-1830.....	512	PL1245-1103.....	411, 474
G4220-60007.....	53	G7100-60007.....	199	PL1117-6800.....	512	PL1245-3102.....	474
G4220-60012.....	51	G7100-60033.....	199	PL1117-6830.....	512	PL1245-3103.....	411, 474
G4220-60015.....	51	G7100-60150.....	190	PL1120-3830.....	511	PL1245-3702.....	411, 474
G4220-60016.....	51	G7100-60210.....	190	PL1120-6520.....	525	PL1245-3703.....	411, 474
G4220-60022.....	49	G7100-60230.....	190	PL1120-6830.....	525	PL1249-1120.....	525, 528
G4220-60028.....	49	G7100-60310.....	190	PL1145-1802.....	474	PL1249-6100.....	528
G4220-60035.....	51	G7100-60330.....	190	PL1145-1803.....	474	PL1249-6140.....	528
G4220-63010.....	52	G7100-60400.....	190, 194	PL1147-1501.....	428	PL1249-6150.....	528
G4220-63015.....	52	G7100-62700.....	190	PL1147-6501.....	428	PL1251-1102.....	409, 474
G4226-60021.....	65	G7100-68705.....	200	PL1149-1530.....	525	PL1251-1103.....	409, 474
G4226-60310.....	32, 64	G7100-68723.....	192	PL1149-1840.....	525	PL1251-3102.....	409, 474
G4226-67001.....	67	PCG931AAKIT.....	322	PL1149-3800.....	511	PL1251-3103.....	409, 474
G4226-68735.....	66	PCG932AAKIT.....	322	PL1149-6240.....	525	PL1251-3702.....	409, 474
G4226-87012.....	63	PCG933AAKIT.....	322	PL1149-6250.....	525	PL1251-3703.....	409, 474
G4226-87020.....	63	PCG93LL500X25.....	322	PL1149-6260.....	525	PL1310-0001.....	529
G4226-87201.....	63	PCG93LL500X25WJ.....	322	PL1149-6800.....	525	PL1310-0002.....	529
G4240-23705.....	100	PCG93LL500X50.....	322	PL1149-6801.....	525	PL1310-0005.....	529
G4240-25206.....	100	PCG93LL500X50WJ.....	322	PL1149-6820.....	525	PL1310-0007.....	529
G4240-43200.....	100	PCG93LL500X75.....	322	PL1149-6840.....	525	PL1310-0008.....	529
G4240-87300.....	100	PCG93LL500X75WJ.....	322	PL1149-6850.....	525	PL1310-0012.....	529
G4240-87301.....	100	PCG93LLSTAND123.....	322	PL1149-6860.....	525	PL1310-0016.....	310, 342, 393
G4240-87302.....	100	PL1012-5A05.....	475	PL1151-1802.....	474	PL1310-0036.....	529
G4240-87303.....	100	PL1013-2100.....	511	PL1151-1803.....	474	PL1310-0048.....	529
G4240-87304.....	100	PL1013-2120.....	511	PL1151-3802.....	474	PL1312-1300.....	393, 463
G4240-87309.....	100	PL1013-2300.....	511	PL1151-3803.....	474	PL1312-1301.....	463
G4240-87310.....	100	PL1013-2500.....	511	PL1170-1810.....	342	PL1312-1500.....	393, 463
G4280-60031.....	48	PL1020-2830.....	511	PL1170-1820.....	342	PL1312-1501.....	463
G4280-60033.....	48	PL1049-2800.....	511	PL1170-1830.....	342	PL1312-1502.....	393, 463
G4280-60061.....	48	PL1110-1120.....	500, 502	PL1170-1840.....	342	PL1312-1503.....	463
G4280-68710.....	60, 66	PL1110-1220.....	500, 502	PL1170-1850.....	342	PL1312-1802.....	393, 463
G4280-68730.....	60, 66	PL1110-1320.....	500	PL1170-1860.....	342	PL1312-1803.....	463
G4280-68750.....	60, 66	PL1110-1400.....	508	PL1170-2820.....	342	PL1312-3300.....	393, 463
G4280-68770.....	60, 66	PL1110-1520.....	500	PL1170-2823.....	342	PL1345-1502.....	411, 463
G4296-68715.....	11	PL1110-6100.....	500	PL1170-6810.....	342	PL1345-1503.....	411, 463
G5611-21503.....	51, 64, 101-102	PL1110-6100LS.....	502	PL1170-6820.....	342	PL1351-1502.....	409, 463
G5611-26210.....	52, 101	PL1110-6115.....	505	PL1170-6830.....	342	PL1351-1503.....	409, 463
G5611-60020.....	49, 101	PL1110-6120.....	505	PL1170-6840.....	342	PL1410-0101.....	529
G5611-60025.....	49, 101	PL1110-6125.....	505	PL1170-6860.....	342	PL1410-0200.....	529
G5611-60061.....	48, 101	PL1110-6130.....	505	PL1171-1140.....	342	PL1410-0301.....	529
G5611-60067.....	49, 101	PL1110-6140.....	505	PL1171-6140.....	342	PL1410-0501.....	529
G5611-60500.....	30	PL1110-6150.....	505	PL1210-1120.....	506	PL1412-4100.....	471
G5611-60501.....	30	PL1110-6160.....	505	PL1210-3120EPA.....	507	PL1412-4101.....	471
G5611-60502.....	30	PL1110-6200.....	500	PL1210-6100.....	506	PL1412-4102.....	471
G5611-60503.....	30	PL1110-6200LS.....	502	PL1210-6104.....	506	PL1412-4103.....	471
G5611-63010.....	101	PL1110-6300.....	500	PL1210-6115.....	506	PL1412-4200.....	471

## PART NUMBER INDEX

PL1412-4201.....	471	PL1512-3702.....	470	PL1712-3703.....	470	PL2010-0104.....	537
PL1412-4400.....	471	PL1512-3703.....	470	PL1712-3800.....	470	PL2010-0105.....	537
PL1412-4401.....	471	PL1512-3800.....	310, 393, 470	PL1712-3801.....	470	PL2010-0200.....	535
PL1412-4702.....	471	PL1512-3801.....	310, 393, 470	PL1712-6800.....	470	PL2010-0201.....	535
PL1412-4703.....	471	PL1512-3802.....	310, 393	PL1712-6801.....	470	PL2010-0202.....	535
PL1412-4A05.....	475	PL1512-3803.....	310, 393	PL1745-3102.....	474	PL2010-0203.....	535
PL1412-4K00.....	471	PL1512-5100.....	470	PL1745-3103.....	411, 474	PL2010-0300.....	535
PL1412-4K01.....	471	PL1512-5101.....	470	PL1745-3702.....	474	PL2010-0301.....	535
PL1412-4K02.....	471	PL1512-5102.....	470	PL1745-3703.....	411, 474	PL2010-0400.....	535
PL1412-6100.....	471	PL1512-5103.....	470	PL1751-3102.....	409, 474	PL2010-0401.....	535
PL1412-6101.....	471	PL1512-5200.....	470	PL1751-3103.....	409, 474	PL2010-0402.....	535
PL1412-6102.....	471	PL1512-5201.....	470	PL1751-3702.....	409, 474	PL2010-0403.....	535
PL1412-6103.....	471	PL1512-5400.....	470	PL1751-3703.....	409, 474	PL2010-0501.....	536
PL1412-6200.....	471	PL1512-5401.....	470	PL1812-3102.....	470	PL2010-0505.....	536
PL1412-6201.....	471	PL1512-5500.....	310, 393	PL1812-3103.....	470	PL2010-0601.....	536
PL1412-6400.....	471	PL1512-5501.....	310, 393	PL1812-6100.....	470	PL2010-0605.....	536
PL1412-6401.....	471	PL1512-5702.....	470	PL1812-6101.....	470	PL2012-0001.....	538
PL1412-6702.....	471	PL1512-5703.....	470	PL1812-6200.....	470	PL2012-0005.....	538
PL1412-6703.....	471	PL1512-5800.....	310, 393, 470	PL1812-6201.....	470	PL2012-0010.....	538
PL1412-6800.....	471	PL1512-5801.....	310, 393, 470	PL1812-6400.....	470	PL2012-1001.....	538
PL1412-6801.....	471	PL1512-5802.....	310, 393	PL1812-6401.....	470	PL2012-1005.....	538
PL1412-6A05.....	475	PL1512-5A05.....	475	PL1812-6800.....	470	PL2012-1010.....	538
PL1412-6K00.....	471	PL1514-1900HFIP.....	509	PL1812-6801.....	470	PL2012-2001.....	538
PL1412-6K01.....	471	PL1514-5900HFIP.....	509	PL1845-2102.....	474	PL2012-2005.....	538
PL1412-6K02.....	471	PL1545-1502.....	411	PL1845-2103.....	411, 474	PL2012-2010.....	538
PL1417-0800.....	512	PL1545-1503.....	411	PL1845-3102.....	411, 474	PL2012-3001.....	538
PL1417-0830.....	512	PL1545-1802.....	411	PL1845-3103.....	411, 474	PL2012-3005.....	538
PL1445-4102.....	411, 474	PL1545-1803.....	411	PL1851-2102.....	409, 474	PL2012-3010.....	538
PL1445-4103.....	474	PL1545-3102.....	411, 474	PL1851-2103.....	409, 474	PL2012-4001.....	538
PL1445-4702.....	411, 474	PL1545-3103.....	411, 474	PL1851-3102.....	409, 474	PL2012-4005.....	538
PL1445-4703.....	411, 474	PL1545-3702.....	411, 474	PL1851-3103.....	409, 474	PL2012-4010.....	538
PL1445-6102.....	411, 474	PL1545-3703.....	411, 474	PL1912-1300.....	310, 393	PL2012-5001.....	538
PL1445-6103.....	411, 474	PL1545-3802.....	411	PL1912-1301.....	310, 393	PL2012-5005.....	538
PL1445-6702.....	411, 474	PL1545-3803.....	411	PL1912-1500.....	310, 393	PL2012-5010.....	538
PL1445-6703.....	411, 474	PL1545-5102.....	411, 474	PL1912-1501.....	310, 393	PL2012-6001.....	538
PL1451-4102.....	409, 474	PL1545-5103.....	411, 474	PL1912-1502.....	310, 393	PL2012-6005.....	538
PL1451-4103.....	409, 474	PL1545-5702.....	474	PL1912-1503.....	310, 393	PL2012-6010.....	538
PL1451-4702.....	409, 474	PL1545-5703.....	411, 474	PL1912-1801.....	310, 393	PL2012-7001.....	538
PL1451-4703.....	409, 474	PL1547-1501.....	428	PL1912-1802.....	310, 393	PL2012-7005.....	538
PL1451-6102.....	409, 474	PL1547-5501.....	428	PL1912-1803.....	310, 393	PL2012-7010.....	538
PL1451-6103.....	409, 474	PL1551-1502.....	409	PL1912-1803.....	310, 393	PL2012-8001.....	538
PL1451-6702.....	409, 474	PL1551-1503.....	409	PL1912-3300.....	310, 393	PL2012-8005.....	538
PL1451-6703.....	409, 474	PL1551-1802.....	409	PL1912-3301.....	310, 393	PL2012-8010.....	538
PL1510-1100.....	504	PL1551-1803.....	409	PL1912-3500.....	310, 393	PL2012-9001.....	538
PL1510-1200.....	504	PL1551-3102.....	409, 474	PL1912-3501.....	310, 393	PL2012-9005.....	538
PL1510-1300.....	504	PL1551-3103.....	409, 474	PL1912-3802.....	310, 393	PL2012-9010.....	538
PL1510-1500.....	504	PL1551-3702.....	409, 474	PL1912-3803.....	310, 393	PL2013-1001.....	538
PL1510-1504.....	504	PL1551-3703.....	409, 474	PL1912-5500.....	310, 393	PL2013-1005.....	538
PL1510-5100.....	504	PL1551-3802.....	409	PL1912-5501.....	310, 393	PL2013-1010.....	538
PL1510-5200.....	504	PL1551-3803.....	409	PL1912-5801.....	310, 393	PL2013-2001.....	538
PL1510-5300.....	504	PL1551-5102.....	409, 474	PL1945-1502.....	411	PL2013-2005.....	538
PL1510-5500.....	504	PL1551-5103.....	409, 474	PL1945-1503.....	411	PL2013-2010.....	538
PL1510-5504.....	504	PL1551-5702.....	409, 474	PL1945-1802.....	411	PL2013-3001.....	538
PL1512-1300.....	310, 393	PL1551-5703.....	409, 474	PL1945-1803.....	411	PL2013-3005.....	538
PL1512-1301.....	310, 393	PL1570-5810.....	342	PL1945-3802.....	411	PL2013-3010.....	538
PL1512-1500.....	310, 393	PL1612-1801.....	310, 393	PL1945-3803.....	411	PL2013-4001.....	538
PL1512-1501.....	310, 393	PL1670-0810.....	342	PL1951-1502.....	409	PL2013-4005.....	538
PL1512-1502.....	310, 393	PL1670-0820.....	342	PL1951-1503.....	409	PL2013-4010.....	538
PL1512-1503.....	310, 393	PL1670-0830.....	342	PL1951-1802.....	409	PL2013-5001.....	538
PL1512-1801.....	310, 393	PL1670-0840.....	342	PL1951-1803.....	409	PL2013-5005.....	538
PL1512-1802.....	310, 393	PL1670-0850.....	342	PL1951-3802.....	409	PL2013-5010.....	538
PL1512-1803.....	310, 393	PL1670-0860.....	342	PL1951-3803.....	409	PL2013-6001.....	538
PL1512-3100.....	470	PL1671-0140.....	342	PL1C12-2502.....	393	PL2013-6005.....	538
PL1512-3101.....	470	PL1712-3100.....	470	PL1E10-3120EPA.....	507	PL2013-6010.....	538
PL1512-3102.....	470	PL1712-3101.....	470	PL1E10-6120EPA.....	507	PL2013-7001.....	538
PL1512-3103.....	470	PL1712-3102.....	470	PL1E12-5A05.....	475	PL2013-7005.....	538
PL1512-3200.....	470	PL1712-3103.....	470	PL1F70-6830.....	342	PL2013-7010.....	538
PL1512-3201.....	470	PL1712-3200.....	470	PL1F70-6850.....	342	PL2013-8001.....	538
PL1512-3300.....	310, 393	PL1712-3201.....	470	PL2010-0100.....	537	PL2013-8005.....	538
PL1512-3301.....	310, 393	PL1712-3400.....	470	PL2010-0101.....	537	PL2013-8010.....	538
PL1512-3401.....	470	PL1712-3401.....	470	PL2010-0102.....	537	PL2013-9001.....	538
PL1512-3501.....	310, 393	PL1712-3702.....	470	PL2010-0103.....	537	PL2013-9005.....	538

PL2013-9010.....	538	PL2023-6005.....	540	PL2083-2010.....	542	PL2144-2000.....	545
PL2014-0001.....	538	PL2023-6010.....	540	PL2083-3001.....	542	PL2144-2001.....	545
PL2014-0005.....	538	PL2023-7001.....	540	PL2083-3005.....	542	PL2144-3000.....	545
PL2014-0010.....	538	PL2023-7005.....	540	PL2083-3010.....	542	PL2144-3001.....	545
PL2014-1001.....	538	PL2023-7010.....	540	PL2083-4001.....	542	PL3540-C603VP.....	476
PL2014-1005.....	538	PL2023-8001.....	540	PL2083-4005.....	542	PL3540-D603VP.....	476
PL2014-1010.....	538	PL2023-8005.....	540	PL2083-4010.....	542	PL3540-P603VP.....	476
PL2014-2001.....	538	PL2023-8010.....	540	PL2083-5001.....	542	PL3549-3603VP.....	476
PL2014-2005.....	538	PL2023-9001.....	540	PL2083-5005.....	542	PL3554-1602dAbz.....	347
PL2014-2010.....	538	PL2023-9005.....	540	PL2083-5010.....	542	PL3554-1602dCac.....	347
PL2014-3001.....	538	PL2023-9010.....	540	PL2083-6001.....	542	PL3554-1602dCbz.....	347
PL2014-3005.....	538	PL2024-0001.....	540	PL2083-6005.....	542	PL3554-1602dGdmf.....	347
PL2014-3010.....	538	PL2024-0005.....	540	PL2083-6010.....	542	PL3554-1602dGibu.....	347
PL2014-4001.....	538	PL2024-0010.....	540	PL2083-7001.....	542	PL3554-1602dT.....	347
PL2014-4005.....	538	PL2024-1001.....	540	PL2083-7005.....	542	PL3554-4602dAbz.....	347
PL2014-4010.....	538	PL2024-1005.....	540	PL2083-7010.....	542	PL3554-4602dCac.....	347
PL2014-6001.....	538	PL2024-1010.....	540	PL2083-8001.....	542	PL3554-4602dCbz.....	347
PL2014-6005.....	538	PL2024-2001.....	540	PL2083-8005.....	542	PL3554-4602dGdmf.....	347
PL2014-6010.....	538	PL2024-2005.....	540	PL2083-8010.....	542	PL3554-4602dGibu.....	347
PL2014-7001.....	538	PL2024-2010.....	540	PL2083-9001.....	542	PL3554-4602dT.....	347
PL2014-7005.....	538	PL2070-0200.....	535	PL2083-9005.....	542	RMSN-2.....	108
PL2014-7010.....	538	PL2070-0201.....	535	PL2083-9010.....	542	RMSN-4.....	108
PL2014-8001.....	538	PL2070-0202.....	535	PL2084-0001.....	542		
PL2014-8005.....	538	PL2070-0203.....	535	PL2084-0005.....	542		
PL2014-8010.....	538	PL2070-1001.....	542	PL2084-0010.....	542		
PL2014-9001.....	538	PL2070-1005.....	542	PL2084-1001.....	542		
PL2014-9005.....	538	PL2070-1010.....	542	PL2084-1005.....	542		
PL2014-9010.....	538	PL2070-2001.....	542	PL2084-1010.....	542		
PL2020-0200.....	535	PL2070-2005.....	542	PL2084-2001.....	542		
PL2020-0201.....	535	PL2070-2010.....	542	PL2084-2005.....	542		
PL2020-0202.....	535	PL2070-3001.....	542	PL2084-2010.....	542		
PL2020-0203.....	535	PL2070-3005.....	542	PL2090-1000.....	544		
PL2022-2001.....	540	PL2070-3010.....	542	PL2090-3000.....	544		
PL2022-2005.....	540	PL2070-4001.....	542	PL2090-4000.....	544		
PL2022-2010.....	540	PL2070-4005.....	542	PL2090-5000.....	544		
PL2022-3001.....	540	PL2070-4010.....	542	PL2090-6000.....	544		
PL2022-3005.....	540	PL2070-5001.....	542	PL2090-8000.....	544		
PL2022-3010.....	540	PL2070-5005.....	542	PL2091-1000.....	544		
PL2022-5001.....	540	PL2070-5010.....	542	PL2091-2000.....	544		
PL2022-5005.....	540	PL2070-6001.....	542	PL2091-3000.....	544		
PL2022-5010.....	540	PL2070-6005.....	542	PL2091-4000.....	544		
PL2022-6001.....	540	PL2070-6010.....	542	PL2142-3000.....	545		
PL2022-6005.....	540	PL2070-7001.....	542	PL2142-3001.....	545		
PL2022-6010.....	540	PL2070-7005.....	542	PL2142-5000.....	545		
PL2022-7001.....	540	PL2070-7010.....	542	PL2142-6000.....	545		
PL2022-7005.....	540	PL2070-8001.....	542	PL2142-6001.....	545		
PL2022-7010.....	540	PL2070-8005.....	542	PL2142-7000.....	545		
PL2022-8001.....	540	PL2070-8010.....	542	PL2142-7001.....	545		
PL2022-8005.....	540	PL2070-9001.....	542	PL2142-8000.....	545		
PL2022-8010.....	540	PL2070-9005.....	542	PL2142-8001.....	545		
PL2022-9001.....	540	PL2070-9010.....	542	PL2143-0000.....	545		
PL2022-9005.....	540	PL2071-0001.....	542	PL2143-0101.....	545		
PL2022-9010.....	540	PL2071-0005.....	542	PL2143-2000.....	545		
PL2023-0001.....	540	PL2071-0010.....	542	PL2143-2001.....	545		
PL2023-0005.....	540	PL2071-1001.....	542	PL2143-3000.....	545		
PL2023-0010.....	540	PL2071-1005.....	542	PL2143-3001.....	545		
PL2023-1001.....	540	PL2071-1010.....	542	PL2143-4000.....	545		
PL2023-1005.....	540	PL2071-2001.....	542	PL2143-4001.....	545		
PL2023-1010.....	540	PL2071-2005.....	542	PL2143-5000.....	545		
PL2023-2001.....	540	PL2071-2010.....	542	PL2143-5001.....	545		
PL2023-2005.....	540	PL2071-3001.....	542	PL2143-6000.....	545		
PL2023-2010.....	540	PL2071-3005.....	542	PL2143-6001.....	545		
PL2023-3001.....	540	PL2071-3010.....	542	PL2143-7000.....	545		
PL2023-3005.....	540	PL2080-0200.....	535	PL2143-7001.....	545		
PL2023-3010.....	540	PL2080-0201.....	535	PL2143-8000.....	545		
PL2023-4001.....	540	PL2080-0202.....	535	PL2143-8001.....	545		
PL2023-4005.....	540	PL2080-0203.....	535	PL2143-9000.....	545		
PL2023-4010.....	540	PL2083-1001.....	542	PL2143-9001.....	545		
PL2023-5001.....	540	PL2083-1005.....	542	PL2144-0000.....	545		
PL2023-5005.....	540	PL2083-1010.....	542	PL2144-0101.....	545		
PL2023-5010.....	540	PL2083-2001.....	542	PL2144-1000.....	545		
PL2023-6001.....	540	PL2083-2005.....	542	PL2144-1001.....	545		

# Application Title Index

12 phenols analyzed  
using a longer (4.6 x 100 mm)  
Agilent Poroshell 120 EC-C18 column.....231

## A

Adrenocorticosteroids  
on Pursuit PFP and C18 .....290

Agilent Bio SEC-3  
column length comparison, 150 mm .....422

Agilent Bio SEC-3  
column length comparison, 300 mm .....422

Alberta Peptide Institute test mix.....308, 390

Alcohols and aliphatic compounds .....582

Alkyd resin.....519

Amino acid standard separation  
on Eclipse Plus C18.....564

Amitrol in water by LC/MS, 0.05 ppb .....585

An overlay of the original ZORBAX  
Eclipse Plus 5 µm method and Agilent  
Poroshell 120 method. All 11 peaks on  
Poroshell 120 are resolved by the time  
the first peak elutes on the original 5 µm  
ZORBAX Eclipse Plus method .....595

Analgesics.....618

Analgesics: Non-steroidal anti-inflammatory  
drugs: Narrow bore separation .....622

Analysis of Biocides in Hand Sanitizer .....580

Analysis of Bovine Serum Albumin by light  
scattering using ProSEC 300S columns.....429

Analysis of carbohydrates  
on Hi-Plex H columns .....340

Analysis of choline kinase on PL-SAX 4000Å.....407

Analysis of ciprofloxacin  
and ciprofloxacin metabolites.....643

Analysis of diazepam on Rx-C18.....272

Analysis of fruit juice.....338

Analysis of low molecular weight polystyrene  
and oligomer fractions collected from  
OligoPore preparative columns .....522

Analysis of oxidized insulin chains.....553

Analysis of pesticide residues in green tea .....594

Analysis of representative whey proteins .....408

Analysis of sugars with high sodium matrix .....341

Analysis of sweeteners on Hi-Plex Ca columns.....340

Analysis of water soluble vitamins  
in multivitamin tablets .....612

Analytical separation of  
low molecular weight polystyrene .....522

Anesthetics, local: Bonded phase selectivity.....619

Anilines, substituted: Rapid separation .....585

Anthocyanins from blueberries:  
High-efficiency high-speed separation .....598

Antibiotics: High speed separation .....620

Antibodies: Fast separation of IgM  
and IgG antibodies .....565

Antidepressants, tricyclic:  
Comparative separation .....636

Antifungal medications .....621

Antifungals .....290, 621

Antihistamines: Fast separations  
on RRHT Extend-C18 .....617

Antibiotics: Lincomycin and Clindamycin  
by LC-APCI-MS LC-TIC .....620

Aromatic acids/benzoic acids:  
Selectivity differences .....623

Aromatics II.....599

Aspartame: Metabolites and applications.....599

Aspirin and cough remedy .....628

## B

BSA tryptic digest on RRHT.....577

Barbiturates.....643

Baseline expansion of a separation  
of protein standards.....414

Basic antihistamines  
on Extend-C18 at high pH.....275

Benzoic acid/sorbic acid .....609

Bio-Monolith DEAE column monitors  
phage production during fermentation.....415

Blueberry anthocyanin analysis .....594

Brij 35 .....581

## C

Calibration curves .....505

Calibration of the ProSEC 300S  
column with globular proteins .....429

Capillary columns for HPLC  
analyses with UV and MS detection .....455

Carbohydrates in colas.....601

Carbohydrates in juices.....601

Carbohydrates in milk.....602

Carbohydrates: Carbohydrate standards.....600

Carbohydrates:  
Effect of mobile phase strength.....600

Carbohydrates: Sugar alcohols.....601

Catecholamines.....578

Catecholamines/biogenic amines:  
Rapid separation using ion-pair reagents.....623

Charge isoform analysis  
of monoclonal antibodies.....401

Chiral ethiazide (diuretic drug) separation .....624

Chiral separation of S- and R-Norfluoxetine .....626

Chiral separation of atenolol.....627

Chiral separation of  
fluoxetine enantiomers (Prozac) .....624

Chiral separation of hexobarbital.....625

Chiral separation of salbutamol .....626

Chiral separation of tolperison enantiomers .....627

Cocaine and metabolites .....627

Column reproducibility – 200 injections of  
reduced monoclonal antibody using an  
Agilent ZORBAX RRHD 300SB-C3 column.....555

Column stability testing at pH 3 and 60 °C.....257

Column stability testing at pH 7.0 .....258

Columns for sample clean-up.....507

Comparing HILIC and RPLC of morphine  
using Agilent ZORBAX RRHD columns  
with UHPLC/MS .....631

Comparison of Aβ peptide RP-HPLC  
separations at low and high pH.....573

Comparison of Agilent Bio SEC-3  
and competitor column in the analysis  
of a monoclonal antibody.....420

Comparison of PolyPore  
with conventional individual  
pore size GPC columns .....517

Comparison of phenols separation  
with Poroshell 120.....584

Components of green tea separated  
on Rapid Resolution StableBond SB-C8 .....625

Consistent ion-exchange  
MAb separation .....400, 562

Corn syrup, Hi-Plex.....339

Cough formula mixture:  
Fast and efficient separation .....628

Cough/cold remedies on ZORBAX 300SCX .....334

Crude bradykinin prep load .....469

Crude peptide screen.....476

## D

DNPH: Derivatized Aldehydes  
obtained from air.....584

Deoxynucleosides: Using rapid resolution  
3.5 µm columns.....577

Determination of anthocyanins in blueberries .....597

Dexamethasone, USP method: Rapid analysis.....639

Differences in composition of  
two alkyl naphthalene sulfonates .....527

Dimethyl-C18/amide, Bonus-RP .....280

## E

EasiVial PS-H .....533

Eclipse Plus C18 vs. C8 .....250

Eclipse Plus C8 is less retentive  
than Eclipse Plus C18 .....251

Eliminate tailing and maximize resolution  
with Eclipse Plus Columns.....250

Environmental phenols on Poroshell 120.....230

Epoxy resin .....501

Excellent separation of two phenol  
formaldehyde resins with PolarGel-M.....513

Exceptional Lot-to-lot Reproducibility.....426

Exceptional separating power .....403

Exploiting chemical stability –  
NH<sub>4</sub>OH concentration.....308, 390

Explosives and related compounds:  
Qualitative and quantitative analysis.....586

Explosives from soil extract .....587

Extend-C18 provides good peak shape  
at low pH .....276

## F

Fast analysis 11 common compounds  
found in analgesics .....615

Fast analysis of cefepime  
and related impurities .....217, 611

Fast analysis of Pindolol .....642

Fast analysis of sulfa drugs.....596

Fast and ultra-fast analysis  
of basic compounds.....251, 617

- Fast LC/MS/MS analysis of group 4 pharmaceuticals from EPA 1694 .....583
- Fast method for ginseng analyses scaled from a traditional method.....612
- Fast separation of recombinant human erythropoietin.....553
- Fast separation of reduced monoclonal antibody.....375
- Fast vitamin E analysis on Rapid Resolution HT .....608
- Fast, high-resolution separation of peptides and proteins with Poroshell 300SB-C18.....572
- Faster analysis of USP Method for simvastatin tablet.....615
- Faster separation of sulfa drugs.....616
- Faster separations using Agilent weak cation-exchange columns.....560
- Fat-soluble vitamins on ZORBAX Eclipse XDB-C8.....605
- Five different bonded phases provide selectivity options.....266
- Flavoring agents.....602
- Food colors, FD&C.....602
- Four different 300SB bonded phases optimize separation of large polypeptides.....371
- Fraction analysis – the concentration overload purification .....469
- G**
- Glycosylated proteins: Large Molecules on Poroshell 300SB-C18 and 300SB.....565
- Goldenseal and related alkaloids on Rapid Resolution Eclipse XDB-C18.....625
- Good peak shape over a wide pH range with ZORBAX Eclipse XDB.....257
- Gradient optimizations for ultra-fast analysis of reduced monoclonal antibody .....556
- Guaifenesin: USP analysis of guaifenesin.....629
- H**
- HPLC of 25 bp DNA ladder .....307, 388
- HPLC separation of 12 phenols performed in just 5 minutes – and under 400 bar – using an Agilent Poroshell 120 EC-C18 column .....231
- HSA tryptic digest on ZORBAX Rapid Resolution HT 1.8 µm.....566
- Heparin.....526
- Herbicide/pesticide standards: Effect of bonded phase .....588
- Herbicides on different bonded phases.....587
- Herbicides: Rapid separation.....591
- High Resolution of 24 Amino Acids Using ZORBAX Eclipse AAA Protocol.....396
- High purity and high recovery with ZORBAX PrepHT columns.....315
- High resolution and fast analysis on RRHT Eclipse PAH column.....254
- High resolution normal-phase separation of octylphenoxy ethanol surfactant on ZORBAX CN.....327
- High resolution separation of a Poly-T-Oligonucleotide size standard spiked with 10-mer, 15-mer, 30-mer and 50-mer (main peaks).....408
- High sensitivity with capillary columns .....453
- Higher resolution of intact monoclonal antibody...368
- Higher resolution of oxidation study .....354, 368
- Hormones/steroids.....633
- Human serum: Low abundance protein isolation and identification from 1-D gel band by LC/MS .....454, 566
- Hyaluronic acid.....527
- Hydrophilic purine/pyrimidine separation.....579
- I**
- Ibuprofen: Optimizing selectivity with RRHT Columns.....618
- Improved peak shape of basic compounds using Bonus-RP .....279
- Improved reproducibility of monoclonal antibodies.....369
- Improved resolution with smaller particle size with Agilent weak cation-exchange columns.....559
- Increase peak capacity with RRHT columns.....240
- Increased resolution for peptide mapping...357, 369
- Intact MAb monomer and dimer separation .....355, 419, 563
- L**
- LC/MS analysis of angiotensin on Extend-C18 .....377
- LC/MS performance test mix for Polaris C8-A .....299
- Lamotrigine .....642
- Large fibrous proteins.....309, 392
- Liquid chromatography phase test mixture (LPTM) on Pursuit C8 .....290
- Local anesthetics.....619
- Long life at high pH with 300Extend-C18.....378
- Long life at high pH with Extend-C18.....275
- Long lifetime of RRHT columns at elevated temperatures.....241
- M**
- Mechanical stability of Pursuit XRs.....289
- Metronidazole: Updating USP methods.....629
- Microbore HPLC for sensitive peptide analysis...462
- MicroBore Poroshell 300 columns provide maximum sensitivity for LC/MS.....382
- Mixture of beta blockers.....613
- Monoclonal IgG1 chains: Separation on Poroshell 300SB-C8 .....383, 567
- Morphine and metabolites: Extracted blood plasma sample separation.....630
- N**
- Naproxen analysis .....611
- Natural products – capsaicin and dihydrocapsaicin on Pursuit XRs C18.....319
- Neutraceuticals: Extract from green tea.....603
- Neutraceuticals: Hypericin separation in St. John's Wort.....632
- New levels of sensitivity and resolution.....235
- Nucleosides, purines and pyrimidines .....564
- Nucleosides: Separation of deoxy and ribonucleosides.....568
- Nucleotides: Separation of mononucleotides...568
- O**
- Oligosaccharides.....610
- Opiates (drugs of abuse) by LC/MS.....630
- Optimize separations with Eclipse XDB selectivity options.....259
- Optimizing protein separations with Agilent weak cation-exchange columns.....558
- Organic acid analysis.....338
- Organic acids separated on ZORBAX SB-Aq.....581
- Overlay of UV and Light Scattering 90° for a Sample of γ-globulins, Illustrating Monomer, Dimer, Trimer, and Aggregate Peaks.....430
- Overlay of UV and light scattering 90° for a sample of γ-globulins, illustrating monomer, dimer, and trimer peaks .....430
- P**
- pH gradient elution for improved separation of monoclonal antibody charged variants.....561
- PLgel LS column .....503
- PLgel Olexis reveals true modalities across the range of polyolefins.....508
- Parabens: High speed separation.....604
- Peak shape and efficiency are better with ZORBAX Eclipse Plus.....249
- Peptide RP-HPLC/ESI-MS using NH4OH mobile phase yields both positive and negative ion spectra.....573
- Peptides/proteins: Effect of elevated temperature.....370, 571
- Peptides/proteins: Equivalent gradient separations.....571
- Peptides: Effect of TFA concentration.....370, 569
- Peptides: Separation of antitensins I, II, III with TFA and NH4OH .....570
- Peptides: Separation of antitensins I, II, III with TFA and NH4OH .....632
- Phenols, substituted .....592
- Phenoxyacid herbicides .....591
- Plant hormones: Rapid gradient elution separation.....593
- Plasticized PVC.....501
- Polyamides .....509
- Polycyclic aromatic hydrocarbons according to EPA Method 610.....589
- Polyester .....519
- Polyesterimide .....520
- Polyethylene Glycol/Oxide standards .....542
- Polyethylene glycols .....307, 388
- Polymethylmethacrylate in DMF.....517
- Polymethylmethacrylate standards.....540
- Polyol.....501
- Polyphenylene Sulfides.....500
- Polystyrene standards .....538
- Polyurethanes.....520
- Polyvinyl alcohol .....526, 528
- Pore size choice: Mouse IgG .....421
- Pore size choice: Proteins.....421
- Poroshell 120 EC-C18 for fast UHPLC separations .....232
- Poroshell 300 columns separate proteins and peptides in seconds .....381

- Preparative fractionation of a culture filtrate containing amyloglucosidases on Agilent PL-SAX 4000A .....473
- Preparative scale purification of Leuprolide by concentration overload .....359
- Preparative separation of low molecular weight polystyrene .....522
- Protein digest analysis .....552
- Protein elution pattern on ZORBAX Poroshell 300SB-C8 .....384
- Proteins in a complex sample by 2-D HPLC with Nano HPLC columns .....457
- Proteins: Effect of bonded phase .....575
- Proteins: Effect of bonded phase, RP .....575
- Pullulan polysaccharide standards .....544
- Purification of a 25-mer trityl-off oligonucleotide and analytical quantitation of the fraction using PLRP-S 100Å, 4.6 x 50 mm .....469
- Purification of a large oligonucleotide .....473
- 
- Q**
- Quantification and qualification of vitamin C and citric acid in fresh grapefruit juice .....609
- 
- R**
- Rapid analysis of an analgesic tablet, selectivity differences at pH 2.7 and pH 7 .....250
- Rapid method development for 18 compounds with an Agilent RRHD Eclipse PAH column .....590
- Rapid Resolution HT (RRHT) provides double the efficiency of Rapid Resolution columns .....240
- Reduce analysis time dramatically with Rapid Resolution HT columns .....241
- Reduce peptide map analysis time by 90% with Poroshell 300SB .....382
- Resin analysis by rapid GPC .....511
- Rose wine .....610
- 
- S**
- SB-CN optimizes retention and resolution .....266
- Scale-up from analytical to prep .....321
- Selectivity changes for basic compounds with Eclipse XDB and StableBond .....258
- Selectivity comparison of TFA and NH<sub>4</sub>OH for peptide RP-HPLC\ESI-MS analysis .....574
- Selectivity comparison of TFA and NH<sub>4</sub>OH Selectivity comparison: C18 columns .....236
- Selectivity comparison: Phenyl columns .....237
- Selectivity for urea pesticides .....259
- Selectivity in peptide RP-LC .....389
- Selectivity test mix for Polaris columns .....299
- Separation of 20 PAHs on Eclipse PAH .....591
- Separation of 8 steroids .....613
- Separation of azo dye degradation products .....583
- Separation of Azo Dyes .....598
- Separation of EPA 610 PAH Mix .....589
- Separation of a tryptic digest on ZORBAX MicroBore 300SB-C18 .....461
- Separation of basic peptides on Bonus-RP versus traditional Alkyl phase .....569
- Separation of charge variants of human IgG1 with pH gradient .....355
- Separation of group 4 analytes in EPA 1694 on ZORBAX HILIC Plus column .....325
- Separation of heated, stressed MAb .....563
- Separation of highly basic antidepressants above their pKa in free base form (pKa 9.5-9.7) .....635
- Separation of licorice root on RRHD columns .....234
- Separation of pharmaceutical cardiac drugs .....616
- Separation of polypeptides in under 1 minute .....572
- Separation of protein standards on Agilent 3 µm ion-exchange columns by cation-exchange chromatography .....403
- Separation of recombinant human erythropoietin (rEPO) .....562
- Separation of small molecule anorectics .....622
- Separation of vitamin D2/D3 .....605
- Separation optimization for ultra-fast analysis of reduced and alkylated monoclonal antibody .....554
- Several ZORBAX RRHD 1.8 µm selectivities facilitate method development .....614
- Short-chain ZORBAX 300SB-C3 is stable at low pH, high temperature .....371
- Shorter chain ZORBAX SB-CN is also stable at low pH (pH 2.0, 50 °C) .....265
- Space .....265
- Sports drink .....610
- StableBond SB-C18 shows excellent stability at low pH and high temperature .....265
- Standard ion-exchange protein separation .....407, 576
- Standard protein separation .....410
- Standard proteins by reversed-phase .....576
- Starches .....500
- Steroids .....634
- Steroids: Easy scalability using Agilent Prep columns .....312
- Steroids: Separation .....633
- Sub 1 minute separations with RRHD columns .....235
- Sugars .....604
- Sugars in plain and milk chocolate .....604
- Sulfa drugs .....641
- Sulfonamides – Fast analysis with RRHT columns .....640
- Sunscreen ingredients: Perform conventional, fast and ultra-fast separations on the same column family .....607
- Superior loadability on Agilent Prep C18 with basic compounds .....312
- 
- T**
- Temperature as a tool to enhance mass transfer and improve resolution of oligonucleotides in ion-pair reversed-phase HPLC .....391, 579
- Ten cardiac drugs on Rapid Resolution HT SB-C18 .....640
- Theobromine in beverages .....608
- Tocopherols by LC/MS with APPI .....603
- Triamcinolone – USP analysis of triamcinolone .....635
- Triazine pesticides on Bonus-RP and Alkyl C8 phase .....592
- Tricyclic antidepressants .....636
- Tricyclic antidepressants and benzodiazepines .....289
- Tricyclic antidepressants and metabolites: Effect of pore size .....637
- Triton X-114: Decreasing run-time by changing bonded phase .....580
- Two samples of melamine resin analyzed by PolarGel-L .....513
- 
- U**
- UHPLC efficiency at HPLC pressures .....230
- Ultra-high speed and high resolution of intact monoclonal antibodies .....557
- USP analysis of tetracyclines .....639
- USP method: Glyburide and internal standard, progesterone .....638
- USP method for sorbitol .....341
- USP methods for sugar alcohols .....339
- Ulcer treatment drugs at intermediate pH .....637
- Urine, LSD analysis by LC/MS .....638
- Use ZORBAX Extend-C18 for alternate selectivity at high pH .....378, 567
- 
- V**
- VX nerve agent metabolites by LC/MS-IS standard (C13 labeled) .....593
- Virtually eliminate retention time variations .....400
- 
- W**
- Warfarin: USP chromatographic purity method using Eclipse XDB-CN .....640
- Water-soluble B vitamins separated on ZORBAX SB-Aq .....607
- Water-soluble vitamins .....605
- Water-soluble vitamins using the USP 23 method .....606
- Water-soluble vitamins: High speed separation using ion-pairing .....606
- Weak cation-exchange chromatography for P128 therapeutic protein sample on the Agilent 1260 Bio-inert Quaternary LC system using different cation-exchange columns .....404
- Whey proteins in dairy samples – milk .....391, 578
- 
- X**
- Xanthines: Higher resolution, same selectivity with RRHT .....617
- 
- Z**
- ZORBAX Bio-SCX Series II provides more retention of small peptides .....459
- ZORBAX Bonus-RP is stable at low and mid pH .....279
- ZORBAX Bonus-RP provides unique selectivity .....280
- ZORBAX Eclipse Plus: Best peak shape in the industry without tailing .....249
- ZORBAX Nano columns for high sensitivity protein digest analysis by LC/MS .....453

## Compound Index

<b>A</b>			
Acebutolol	613		
Acenaphthene	589-591		
Acenaphthylene	589-591		
Acephate	594		
Acetaldehyde – DNPH	584		
Acetamide	615		
2-Acetamidophenol	235, 615		
Acetaminophen	235, 250, 615, 618, 628		
Acetanilide	235, 618		
Acetate	174-175		
Acetic Acid	581		
Acetone	582		
Acetone – DNPH	584		
Acetophenone	599		
6-Acetylmorphine	628		
Acetylsalicylic acid	235, 250, 618, 628		
Acrolein – DNPH	584		
Adenine	564, 579		
Adenosine	564, 568		
Adonitol	339		
Adrenaline	578		
Alanine	396, 564		
Alanine-3-Glycine-4	308, 390		
Albuterol	325, 583		
Alprenolol	613		
2-Amino-5-azotoluene	183		
4-Aminobenzoic acid	290, 621		
p-Aminobenzoic acid	609		
3-Amino-benzonitrile	585		
7-Aminoclonazepam	289		
2-Amino-4,6-dinitrotoluene	586-587		
4-Amino-2,6-dinitrotoluene	587		
4-Amino-4,6-dinitrotoluene	586		
7-Aminoflunitrazepam	289		
2-Aminonaphthalene	183		
2-Amino-4-nitrotoluene	586-587		
2-Amino-6-nitrotoluene	586-587		
4-Amino-2-nitrotoluene	586		
Amitriptyline	258, 289, 635-637		
cis-10-OH -Amitriptyline	637		
trans-10-OH -Amitriptyline	637		
Ammonium	173		
Amylbenzene	299		
Amylobarbitone	643		
Anadamine	236		
Androstadiene 3,17 dione	613		
Anethole	602		
Angiotensin I	308, 377, 389-390, 462, 570		
Angiotensin II	194, 308, 370, 377, 381, 389-390, 462, 570-572		
Angiotensin III	308, 377, 389-390, 570		
Aniline	183, 583, 598		
p-Cl-Aniline	183		
Anisidine	598		
p-Anisidine	585		
Anthracene	189, 589-591		
$\alpha$ -1-Antichymotrypsin	454, 566		
Antithrombin-III	454, 566		
Apomyoglobin	572		
Aprotinin	403		
Arabinose	341		
Arabitol	339		
2-Arachinoylglycerol	381		
Arginine	396, 564		
Arsenate	175		
Arsenite	175		
Ascorbic acid	612		
Asparagine	396, 596		
Aspartame	232, 290, 299, 599		
Aspartic acid	396, 596		
Aspartic acid-phenylalanine dipeptide	599		
Atenolol	613		
Atrazine	587-588, 591		
Azide	172, 175, 421		
<b>B</b>			
Barberine	625		
Barbital	258		
Barbitone	643		
Beclomethasone	290		
Bendroflumethiazide	189		
Bentazon	587		
Benzaldehyde – DNPH	584		
Benz(e)pyrene	591		
Benzidine	183, 583, 598		
1,2-Benzisothiazol-3(2H)-one	580		
Benzisothiazol-3(2H)-one	235		
Benzo(a)anthracene	589-591		
Benzo(a)pyrene	589-591		
Benzo(b)fluoranthene	589-591		
Benzocaine	619		
Benzo(g,h,i)perylene	589-591		
Benzoic acid	232, 290, 389, 580, 602, 609, 621, 629		
Benzo(k)fluorene	589-591		
Benzophenone	618		
Benzoyllecgonine	627		
Benzthiazuron	588		
n-6-Benzyl adenine	593		
5-Benzyl-3,6-dioxo-2-piperazineacetic acid	599		
Berberine	251, 617		
Biosynthetic human insulin	384		
Biotin (B7)	612		
Biphenyl	189		
Bovine carbonic anhydrase	407, 576		
Bromide	172		
BSA	382, 425-426, 432, 576-577		
Bumetanide	189		
Buspirone	616		
Butacaine	266, 619		
tert-butanol	582		
2-Butanone (MEK) – DNPH	584		
Butylbenzene	299		
Butylparaben	189, 241, 604		
n-Butyraldehyde – DNPH	584		
<b>C</b>			
Caffeine	232, 235, 250, 258, 276, 299, 316, 334, 599, 608, 615		
Calcium	173		
Calmodulin	571		
Canadine	625		
Carbamazepine	618, 632		
Carbaryl	594		
Carbendazim	235, 580, 594		
Carbonate	175		
Carbonic Anhydrase	370-371, 381-382, 408, 571-572		
Carvone	602		
Catalase	432		
Catechol	230-231, 584, 603, 625		
Cefazolin	620		
Cefepime	217		
Cefotaxime	620		
Ceftazidime	620		
Celecoxib	235		
Cephaclor	280		
Cephalexin	280		
Cephoxitin	280		
Cephuroxime	280		
Chlorate	172		
Chloride	172, 174-175		
Chloroaniline	583, 598		
m-Chloroaniline	585		
o-Chloroaniline	585		
p-Chloroaniline	585		
2-Chlorobenzoic	623		
Chlorocaine	619		
4-Chloro-3-methylphenol	592		
5-Chloro-2-methyl-4-isothiazolin-3-one	235		
2-Chlorophenol	592		
o-Chlorophenoxyacetic acid	591, 593		
p-Chlorophenoxyacetic acid	591, 593		
o-Chlorophenoxy propionic acid	593		
Chlorothiazide	189		
Chlorpheniramine	275, 279, 617, 628		
Chlorthalidone	189		
Chrysene	589-591		
Chymotrypsinogen A	410		
Cimetidine	325, 583, 637		
d-Cinchonine	266, 619		
Cinnamaldehyde	599		
Ciprofloxacin	620		
Citrate	174		
Citric Acid	338, 396, 581, 609-610		
Clindamycin	620		
Clomipramine	289		

Clonazepam .....289  
 Clotrimazole .....621  
 Cobalamin (B12) .....612  
 Cocaine .....619, 627  
 Codeine .....630  
 Corticosterone .....290  
 Cortisone .....290, 299  
 Cortisone acetate .....290  
 m-Cresol .....590  
 o-Cresol .....230-231, 584, 592  
 p-Cresol .....230-231, 584  
 Crotonaldehyde – DNPH .....584  
 Cyanide .....175  
 Cyanidin .....237, 597  
 Cyanocobalamin (B12) .....605  
 p-Cymene .....599  
 Cyprodinil .....594  
 Cysteine .....396  
 Cytidine .....568  
 Cytochrome C .....183, 382, 370-371, 400, 403,  
 410, 558-560, 571, 572, 576  
 Cytodine .....564  
 Cytosine .....564, 579

**D**

Daidzen .....266  
 Dehydroacetic acid .....232  
 Delphinidin .....237, 597  
 2' Deoxycytidine .....568  
 2' Deoxyguanosine .....568  
 2' Deoxyinosine .....568  
 Desethylatrazine .....588  
 Desethyldeisopropylatrazine .....588  
 Desipramine .....289  
 Dextromethorphan .....628  
 Diazepam .....272, 289  
 Dibenzo(a,h)anthracene .....589-591  
 Dichlorobenzidine .....583, 598  
 3,3-Dichlorobenzidine .....183  
 2,4-Dichlorophenol .....592  
 2,3-Dichlorophenoxyacetic acid .....591  
 2,4-Dichlorophenoxyacetic acid .....591  
 Diclofenac .....235, 615, 618  
 Dienestrol .....633  
 Diethylstilbestrol .....265  
 Diflusalin .....235, 615  
 Dihydroxy benzylamine .....623  
 Dihydroxyphenyl acetic acid .....623  
 Dihydroxyphenyl alanine .....623  
 Diltiazem .....616  
 Dimethoxybenzidine .....598  
 3,3'-Dimethoxybenzidine .....583  
 Dimethylbenzidine .....583  
 2,3-Dimethyl phenol .....230-231, 530  
 2,4-Dimethyl phenol .....592  
 2,5-Dimethyl phenol .....230-231, 530  
 3,4-Dimethyl phenol .....231, 584  
 1,3-Dimethyluric acid .....617  
 Dimethylxanthine .....276

1,7-Dimethylxanthine .....617  
 3,7-Dimethylxanthine (theobromine) .....617  
 1,3-Dinitrobenzene .....586-587  
 2,4-Dinitrophenol .....592  
 2,4-Dinitrotoluene .....586-587  
 2,6-Dinitrotoluene .....586-587  
 Dioctyl phthalate .....290, 299  
 Diphenhydramine .....275, 617, 632  
 Diphenylamine .....586  
 Dipropyl phthalate .....241  
 Dipropylththalate .....250  
 Dipyridamole .....616  
 Disopyramide .....640  
 Diuron .....259, 587-588, 591  
 Dopamine .....578, 623  
 Doxepin .....258, 289, 635-636  
 Doxycycline .....639  
 Doxylamine .....275, 279, 617  
 Dulcitol .....339

**E**

Epinephrine .....623  
 Ecgonine methylester .....627  
 Econazole .....621  
 Eletriptan .....616  
 Epagalocatechin .....603  
 Epicatechin .....603, 625  
 Epicatechin gallate .....603, 625  
 Epigallocatechin .....625  
 Epigallocatechin gallate .....603, 625  
 Estradiol .....633  
 β -Estradiol .....613  
 Estriol .....266  
 Estrone .....613  
 Ethanol .....582, 610  
 Ethinylestradiol .....633  
 Ethoprophos .....594  
 Ethyl cinnamate .....599  
 2-Ethylhexyl *trans*-4-methoxycinnamate .....607  
*bis*-(2-Ethylhexyl) phthalate .....507  
 Ethylhexyl salicylate .....259  
 2-Ethylhexyl salicylate .....607  
 Ethylparaben .....189, 272, 604  
 Eugenol .....599  
 Excipient .....606

**F**

Famotidine .....637  
 Fenfluramine .....622  
 Fenoprofen .....622  
 Fenuron .....259  
 Fibrinogen .....309, 392  
 Flunitrazepam .....289  
 Fluocinolone acetoneide .....290  
 Fluoranthene .....189, 589-591  
 Fluorene .....189, 589-591  
 Fluoride .....172, 175  
 2-Fluorobenzoic .....623

3-Fluorobenzoic .....623  
 Fluorocytosine .....579  
 Folic acid .....605-606, 612  
 Formaldehyde – DNPH .....584  
 Formate .....174  
 Fructose .....338, 340, 600, 604, 610  
 Fumaric Acid .....581  
 Furosemide .....616

**G**

Galactose .....340  
 Genistein .....266  
 γ-Globulin .....421  
 Glucagon .....384  
 Glucose .....338, 340-341, 600, 604, 610  
 Glutamine .....396, 564  
 Glutamate .....175  
 Gly3-Gly4 (Nα-acetylated) .....308, 390  
 Glyburide .....638  
 Glycerol .....610  
 Glyceryl Guaicolate .....334  
 Gluconate .....396, 564  
 Glycine .....389, 396, 564  
 Guaifenesin .....629  
 Guanine .....564, 579  
 Guanosine .....564, 568

**H**

Heptabarbitione .....643  
 Hexaldehyde – DNPH .....584  
 Hexazinon .....588  
 Hexogen (RDX) .....586-587  
 Hexyl .....586  
 Histidine .....396, 564  
 Homocyclonite .....586  
 Homovanillic acid .....623  
 Holotransferrin .....572  
 Hydrastine .....625  
 Hydrochlorothiazide .....189  
 Hydrocortisone .....312, 613, 635  
 Hydroflumethiazide .....189  
 Hydroquinone .....230-231, 584  
 Hydroxyindoleacetic acid .....623  
 2-Hydroxy-4-methoxybenzophenone .....607  
 4-Hydroxypropivacaine .....619  
 Hydroxyproline .....396, 564  
 5- Hydroxytryptamine .....623

**I**

Ibuprofen .....235, 396, 618  
 IgA .....421  
 IgG2a, I HOPC-1 .....565  
 IgM, MOPC-104E .....565  
 Imazalil .....594  
 Imidacloprid .....594  
 Imipramine .....289, 632, 635  
 Indeno(1,2,3-c,d)pyrene .....589-591



Prednisolone.....290, 632  
 Prednisolone acetate.....290  
 Procainamide.....616, 640  
 Procaine.....266, 619, 640  
 Progesterone.....613, 638  
 Promethazine.....632  
 Prometon.....587  
 Prométryne.....587, 591  
 Propanil.....587, 591  
 n-Propanol.....582  
 Propanolol.....636  
 Propazine.....587-588, 591  
 Propionaldehyde – DNPH.....584  
 Propoxur.....594  
 Propranolol.....241, 613, 636, 640  
 Propylparaben.....189, 604  
 Protriptyline.....396, 564, 632  
 Pseudoephedrine.....275, 617, 628  
 Pymetrozine.....594  
 Pyrene.....589-591  
 Pyridine.....249, 389  
 Pyridoxine.....605-607  
 Pyridoxyl phosphate (B6).....612  
 Pyrilamine.....334  
 Pyroglutamate.....174  
 Pyruvate.....174

**Q**

Quercetin.....266

**R**

Raffinose.....340, 600, 604  
 Ranitidine.....325, 583  
 Reserpine.....290, 299  
 Resorcinol.....230-231, 584  
 Retinol.....605  
 Retinol acetate.....605  
 Retinol palmitate.....605  
 Rhamnose.....600  
 Riboflavin (B2).....605-606, 612  
 Ribonuclease (RNase).....371, 381, 571-572  
 Ribonuclease A.....370, 400, 403, 425-426, 558-560, 571-572, 576  
 Ribose.....600  
 Ropivacaine.....619

**S**

Saccharin.....232  
 Saccharose.....600  
 Salicylic acid.....235, 290, 618, 621  
 Sarcosine.....396, 564  
 Scopolamine.....275, 617  
 Sebutylazine.....588  
 Selenate.....175  
 Serine.....396, 564  
 Simazine.....587-588  
 Sodium.....173

Sorbic acid.....290, 609, 621  
 Sorbitol.....338-341, 604  
 Stachyose.....340, 604  
 Succinate.....174  
 Succinic Acid.....338, 581, 610  
 Sucrose.....338, 340-341, 600, 604  
 Sulfachloropyridazine.....616  
 Sulfadiazine.....249, 616, 640-641  
 Sulfadimethoxine.....616, 641  
 Sulfamerazine.....249, 616, 640-641  
 Sulfamethazine.....616, 640-641  
 Sulfamethizole.....616, 641  
 Sulfamethoxazole.....249, 258, 616, 632  
 Sulfamethoxyipyridazine.....616  
 Sulfanilamide.....249, 640-641  
 Sulfanilic acid.....641  
 Sulfapyridine.....616  
 Sulfate.....172, 174-175  
 Sulfathiazole.....249, 616, 640  
 Sulfisoxazole.....641  
 Sulfmethazine.....249  
 Sulfur.....507  
 Sulindac.....235, 615

**T**

Talbarbitone.....643  
 Tartarate.....175  
 Tartaric acid.....338, 610  
 Tebutiuron.....587  
 Terbutylazine.....588  
 Terphenyl-d14.....591  
 o-Terphenyl.....299  
 Testosterone.....312, 613  
 Tetracaine.....266, 619  
 2,3,4,6-Tetrachlorophenol.....592  
 Tetryl.....586-587  
 Theobromine.....276, 316, 608  
 Theophylline.....276, 316, 334  
 Thiabendazole.....594  
 Thiamine pyrophosphate (TPP).....594  
 Thiamine (B1).....607, 612  
 Thiocyanate.....172  
 Thiosulfate.....172  
 Thiourea.....189, 590  
 Threonine (THR).....396, 564  
 Thymidine.....564  
 Thymine.....564, 579  
 Thymol.....602  
 Thyroglobulin.....421, 425-426, 432  
 α-Tocopherol.....605, 608  
 β-Tocopherol.....608  
 γ-Tocopherol.....605, 608  
 Tocopherol acetate.....605  
 o-Tolidine.....598  
 Tolmetin.....235, 615, 618, 622  
 m-Tolualdehyde – DNPH.....584  
 Toluene.....240, 299, 589-591  
 m-Toluic.....623  
 m-Toluidine.....585

o-Toluidine.....183, 583, 598  
 Trehalulose.....600  
 Triamcinolone.....290, 635  
 Triamcinolone acetonide.....290  
 2,4,6-Trichlorophenol.....592  
 2,4,5-Trichlorophenoxyacetic acid.....591  
 3,4,5-Trichlorophenoxyacetic acid.....593  
 2,4,5-Trichlorophenoxypropionic acid (Silvex).....591  
 3,4,5-Trichlorophenoxypropionic acid.....593  
 Triflupromazine.....632  
 Trimipramine.....258, 289, 632, 635-636  
 1,3,5-Trinitrobenzene.....586-587  
 2,4,6-Trinitrotoluene.....586-587  
 Tripelennamine.....632  
 Triphenylene.....299  
 Triprolidine.....275, 279, 617  
 Tryptophan (TRP).....396, 459, 564  
 Tyrosine (TYR).....396, 459, 564  
 Tebutiuron.....591

**U**

Uracil.....240-241, 258, 299, 425-426, 564, 579  
 Uridine.....564, 588

**V**

Valeraldehyde – DNPH.....584  
 Valine.....396, 564  
 Valine3-Glycine4 (Nα-acetylated).....308, 390  
 Valine3-Valine4 (Nα-acetylated).....308, 390  
 Valine-tyrosine-valine.....572  
 Vitamin A.....605  
 Vitamin B12.....421  
 Vitamin C.....605-606, 609  
 Vitamin D2.....605  
 Vitamin D3.....605  
 Vitamin E (a-VE).....605

**W**

Warfarin.....640

**X**

Xanthosine-5'-monophosphate (XMP).....568  
 Xylitol.....339  
 Xylose.....600

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