



# THE Essential

## CHROMATOGRAPHY & SPECTROSCOPY

### CATALOG

20<sup>11</sup><sub>12</sub>  
EDITION

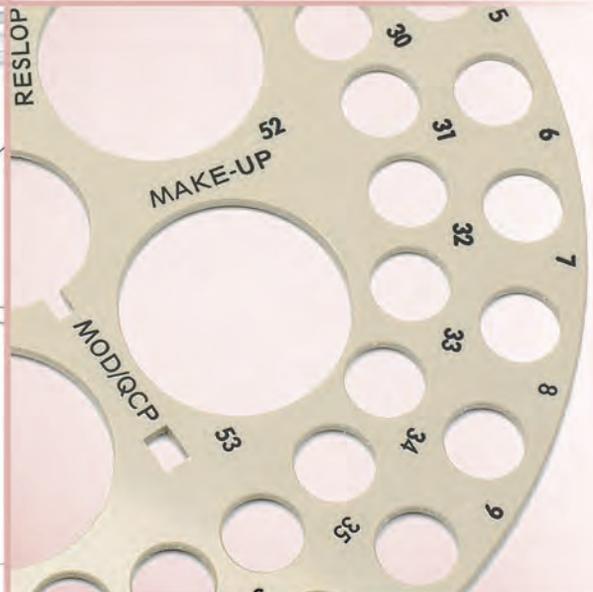
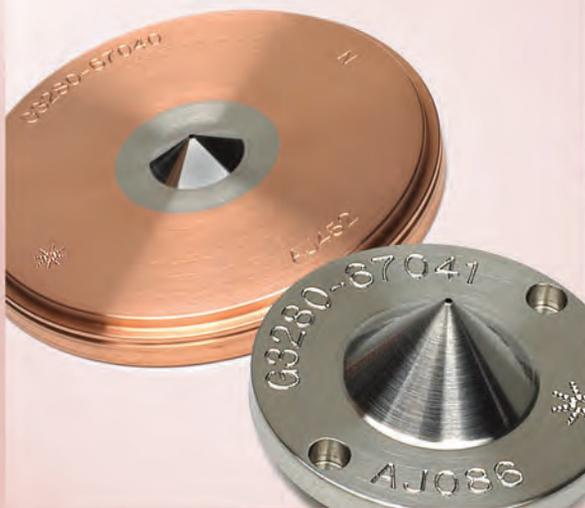
ATOMIC SPECTROSCOPY  
PAGES 1164-1223

The Measure of Confidence



Agilent Technologies

# ATOMIC SPECTROSCOPY



## In this Chapter

### Atomic Absorption

- 1166** Hollow Cathode Lamps
- 1172** Graphite Furnace Parts and Supplies
- 1175** Programmable Sampler  
Dispenser Supplies
- 1180** Burners and Nebulizers
- 1181** SPS 3 Autosampler Supplies
- 1184** SIPS 10/20 Supplies
- 1185** Hydride Modules

### ICP-OES

- 1186** Spray Chambers
- 1188** Nebulizers
- 1189** Torches
- 1191** Tubing
- 1196** Applications Kits

### ICP-MS

- 1200** ICP-MS Maintenance Schedule
- 1201** Gas Line Supplies
- 1203** Sample Introduction Supplies
- 1209** Interface Cones and Ion Lenses
- 1215** Autosampler Supplies
- 1217** Peripherals Supplies

### Atomic Spectroscopy Standards

- 1220** AA and ICP-OES Standards
- 1221** ICP-MS Standards



## ■ ATOMIC ABSORPTION



Fast Sequential Atomic Absorption Spectrometer



Hollow cathode lamp

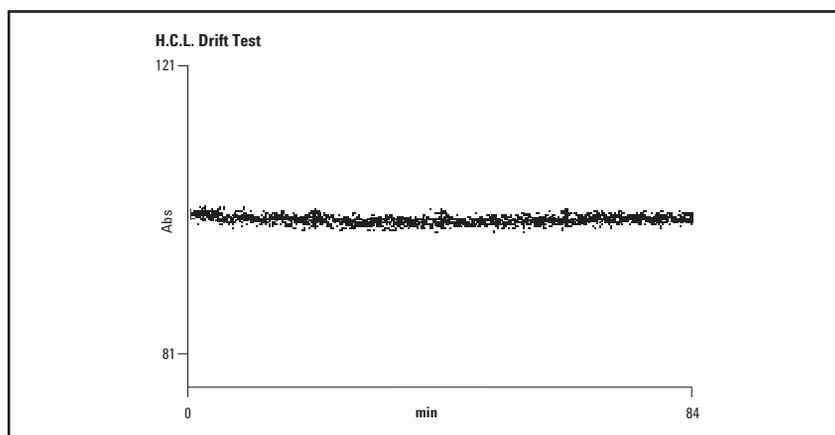
Agilent provides a comprehensive range of consumables for Atomic Absorption, designed to maintain the high performance of your AA instrument. In addition, Agilent continues to research and manufacture an extensive range of single-element and solid-cathode multi-element lamps, plus high-intensity UltraAA lamps for superior cost-effective performance.

## Hollow Cathode Lamps

Hollow cathode lamps provide optimum signal-to-noise performance, permitting determinations at even lower levels with the most demanding applications. We manufacture our lamps and instruments in the same factory, so they are optimized to deliver the best performance from your AA. Our lamps provide high spectral purity because of purified materials, extended processing cycle and factory lamp conditioning procedures. These ensure minimal lamp warm-up time and good stability during operation.

Economical operation is assured by the long lamp life, guaranteed to 5000 mA hours but typically exceeding 8000 mA hours, over and above our factory reconditioning and testing service.

Consistent performance is also assured. All lamps are tested to confirm that the emission intensity exceeds a minimum level. No lamp leaves our factory without having satisfied our demanding test standards. These tests ensure that you receive quality lamps that can provide optimum signal-to-noise and stable performance throughout the life of the lamp.



The trace shows the variation in emission intensity from a lamp over 1 hour 24 minutes. The steady trace demonstrates the superb stability and low drift achieved when using our hollow cathode lamps (after a suitable warm-up period).

## High Intensity UltrAA Coded Single Element Lamps

- Emission intensity is increased by 3-5 times, for lower noise
- Sensitivity is increased by up to 40%, due to the sharper emission profile, allowing determinations at even lower levels
- Element coded for automatic lamp recognition, preventing errors if the wrong lamp position is entered

UltrAA lamps are high-intensity, boosted discharge hollow cathode lamps. They use the standard lamp current, but apply an additional boost discharge within the lamp to increase the emission intensity. The boost current is supplied from a secondary control module (either integrated into the instrument or supplied from an external module).

UltrAA lamps are manufactured from the purest cathode materials, and every lamp is AQ/QC tested to guarantee performance and reliability. These lamps are coded for automatic lamp recognition (except for 50/55 AA, SpectrAA-50/55 and SpectrAA-5 models), eliminating the risk of time-consuming errors when reprogramming the lamp position.

### High Intensity UltrAA Coded Single Element Lamps

Element	Part No.
Antimony – Sb	5610108000
Arsenic – As	5610108100
Bismuth – Bi	5610134200
Boron – B	5610135700
Cobalt – Co	5610134100
Germanium – Ge	5610134300
Gold – Au	5610109000
Iron – Fe	5610108600
Lead – Pb	5610108200
Manganese – Mn	5610133700
Nickel – Ni	5610108500
Palladium – Pd	5610135800
Platinum – Pt	5610135900
Selenium – Se	5610108300
Silicon – Si	5610133400
Tellurium – Te	5610134000
Thallium – Tl	5610108400
Tin – Sn	5610133900

## High Intensity UltrAA Coded Multi-Element Lamps

- Unique combinations of compatible elements extend the versatility and performance of any AA spectrometer
- Save time by avoiding the need to warm up a new lamp
- Same excellent performance as provided by Agilent single element lamps

### High Intensity UltrAA Coded Multi-Element Lamps

Element	Part No.
Aluminum/Calcium/Magnesium – Al/Ca/Mg	5610133600
Cobalt/Chromium/Copper/Iron/Manganese/Nickel	5610134500
Cobalt/Molybdenum/Lead/Zinc – Co/Mo/Pb/Zn	5610135200
Copper/Iron/Manganese/Zinc – Cu/Fe/Mn/Zn	5610135000
Copper/ Iron/Silicon/Zinc – Cu/Fe/Si/Zn	5610135100
Copper/Zinc – Cu/Zn	5610134600
Silver/Cadmium/Lead/ Zinc – Ag/Cd/Pb/Zn	5610108900
Silver/Chromium/Copper/Iron/Nickel – Ag/Cr/Cu/Fe/Ni	5610134900

### High Intensity UltrAA Uncoded Multi-Element Lamps

Element	Part No.
Arsenic/Copper/Iron – As/Cu/Fe	5610135300
Nickel/Selenium – Ni/Se	5610135400

## Background Correction Lamps

Deuterium background correction lamps provide accurate and fast correction over the widest possible absorbance range and are QC-selected for optimum lifetime.

### Background Correction Lamps

Element	Part No.
Deuterium background correction lamp for AA systems	5610021800

## Coded Single Element Lamps

- High performance – manufactured from the purest cathode materials
- Improved productivity – coded lamps make AA easier and more flexible
- Safe operation – lamps are non-hazardous, and non-reactive if unbroken

### Coded Single Element Lamps

Element	Part No.	Element	Part No.
Aluminum – Al	5610100100	Neodymium – Nd	5610103600
Antimony – Sb	5610100200	Nickel – Ni	5610103700
Arsenic – As	5610100300	Niobium – Nb	5610103800
Barium – Ba	5610100400	Osmium – Os	5610103900
Beryllium – Be	5610100500	Palladium – Pd	5610104000
Bismuth – Bi	5610100600	Phosphorus – P	5610107700
Boron – B	5610100700	Platinum – Pt	5610104100
Cadmium – Cd	5610100800	Potassium – K	5610104200
Calcium – Ca	5610101000	Praseodymium – Pr	5610104300
Cerium – Ce	5610101100	Rhenium – Re	5610104400
Cesium – Cs	5610100900	Rhodium – Rh	5610104500
Chromium – Cr	5610101200	Rubidium – Rb	5610104600
Cobalt – Co	5610101300	Ruthenium – Ru	5610104700
Copper – Cu	5610101400	Samarium – Sa	5610104800
Dysprosium – Dy	5610101500	Scandium – Sc	5610104900
Erbium – Er	5610101600	Selenium – Se	5610105000
Europium – Eu	5610101700	Silicon – Si	5610105100
Gadolinium – Gd	5610101800	Silver – Ag	5610105200
Gallium – Ga	5610101900	Sodium – Na	5610105300
Germanium – Ge	5610102000	Strontium – Sr	5610105400
Gold – Au	5610102100	Tantalum – Ta	5610105500
Hafnium – Hf	5610102200	Tellurium – Te	5610105600
Holmium – Ho	5610102300	Terbium – Tb	5610105700
Indium – In	5610102500	Thallium – Tl	5610105800
Iridium – Ir	5610102600	Thulium – Tm	5610106000
Iron – Fe	5610102700	Tin – Sn	5610106100
Lanthanum – La	5610102800	Titanium – Ti	5610106200
Lead – Pb	5610102900	Tungsten – W	5610106300
Lithium – Li	5610103000	Vanadium – V	5610106500
Lutetium – Lu	5610103100	Ytterbium – Yb	5610106600
Magnesium – Mg	5610103200	Yttrium – Y	5610106700
Manganese – Mn	5610103300	Zinc – Zn	5610106800
Mercury – Hg	5610103400	Zirconium – Zr	5610106900
Molybdenum – Mo	5610103500		

**Uncoded Single Element Lamps**

<b>Element</b>	<b>Part No.</b>	<b>Element</b>	<b>Part No.</b>
Aluminum – Al	5610122000	Neodymium – Nd	5610125500
Antimony – Sb	5610122100	Nickel – Ni	5610125600
Arsenic – As	5610122200	Niobium – Nb	5610125700
Barium – Ba	5610122300	Osmium – Os	5610125800
Beryllium – Be	5610122400	Palladium – Pd	5610125900
Bismuth – Bi	5610122500	Phosphorus – P	5610126000
Boron – B	5610122600	Platinum – Pt	5610126100
Cadmium – Cd	5610122700	Potassium – K	5610126200
Calcium – Ca	5610122900	Praseodymium – Pr	5610126300
Cerium – Ce	5610123000	Rhenium – Re	5610126400
Cesium – Cs	5610122800	Rhodium – Rh	5610126500
Chromium – Cr	5610123100	Rubidium – Rb	5610126600
Cobalt – Co	5610123200	Ruthenium – Ru	5610126700
Copper – Cu	5610123300	Samarium – Sa	5610126800
Dysprosium – Dy	5610123400	Scandium – Sc	5610126900
Erbium – Er	5610123500	Selenium – Se	5610127000
Europium – Eu	5610123600	Silicon – Si	5610127100
Gadolinium – Gd	5610123700	Silver – Ag	5610127200
Gallium – Ga	5610123800	Sodium – Na	5610127300
Germanium – Ge	5610123900	Strontium – Sr	5610127400
Gold – Au	5610124000	Tantalum – Ta	5610127500
Hafnium – Hf	5610124100	Tellurium – Te	5610127600
Holmium – Ho	5610124200	Terbium – Tb	5610127700
Indium – In	5610124400	Thallium – Tl	5610127800
Iridium – Ir	5610124500	Thulium – Tm	5610128000
Iron – Fe	5610124600	Tin – Sn	5610128100
Lanthanum – La	5610124700	Titanium – Ti	5610128200
Lead – Pb	5610124800	Tungsten – W	5610128300
Lithium – Li	5610124900	Vanadium – V	5610128500
Lutetium – Lu	5610125000	Ytterbium – Yb	5610128600
Magnesium – Mg	5610125100	Yttrium – Y	5610128700
Manganese – Mn	5610125200	Zinc – Zn	5610128800
Mercury – Hg	5610125300	Zirconium – Zr	5610128900
Molybdenum – Mo	5610125400		

## Coded Multi-Element Lamps

- Primary lines checked to avoid and minimize spectral interferences
- Save time by avoiding the need to warm up a new lamp
- Same excellent performance as provided by Agilent single element lamps

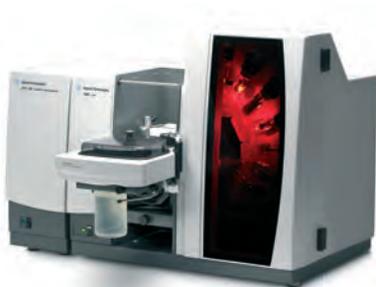
If secondary lines are needed, UltraAA high intensity lamps can help minimize interferences.

### Coded Multi-Element Lamps

Element	Part No.
Aluminum/Calcium/Magnesium – Al/Ca/Mg	5610108800
Calcium/Magnesium – Ca/Mg	5610107100
Cobalt/Chromium/Copper/Iron/Manganese/Nickel – Co/Cr/Cu/Fe/Mn/Ni	5610107600
Cobalt/Molybdenum/Lead/Zinc – Co/Mo/Pb/Zn	5610109800
Copper/Iron/Manganese/Zinc – Cu/Fe/Mn/Zn	5610109600
Copper/Iron/Silicon/Zinc – Cu/Fe/Si/Zn	5610109700
Copper/Zinc – Cu/Zn	5610119200
Silver/Cadmium/Lead/Zinc – Ag/Cd/Pb/Zn	5610108700
Silver/Chromium/Copper/Iron/Nickel – Ag/Cr/Cu/Fe/Ni	5610109500
Sodium/Potassium – Na/K	5610107000

### Uncoded Multi-Element Lamps

Element	Part No.
Barium/Chromium – Ba/Cr	5610133500
Calcium/Magnesium – Ca/Mg	5610129100
Cobalt/Chromium/Copper/Iron/Manganese/Nickel – Co/Cr/Cu/Fe/Mn/Ni	5610129200
Copper/Zinc – Cu/Zn	5610129300
Sodium/Potassium – Na/K	5610129000



280Z Atomic Absorption Spectrometer



Graphite shroud for GTA 120, 6310003100

## Graphite Furnace Parts and Supplies

### Graphite Furnace Operating Kits

Maximize your uptime by keeping one of these kits handy.

#### Kits for GTA 120 Furnace System

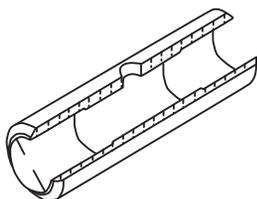
Description			Part No.
GTA 120 Deuterium furnace operating supplies kit			190067900
GTA 120 Zeeman furnace operating supplies kit			190068000
Kit Contents	Kit Quantity	Unit	Part No.
Graphite electrodes For GTA 120	2	2/pk	6310003400
Graphite electrodes For GTA 120 Zeeman	2	2/pk	6310003500
Graphite shroud			6310003100
Notched partitioned tube for fork	5	10/pk	6310002300
Forked pyrolytic graphite platforms	5	10/pk	6310002400
Syringe, 100 $\mu$ L			4710003200
Capillary assembly		5/pk	9910115100
Glass beakers, 25 mL		5/pk	6610008200
Sample vials, 2 mL, conical polyethylene	2	1000/pk	9910028200

#### Kits for GTA 110 Furnace System

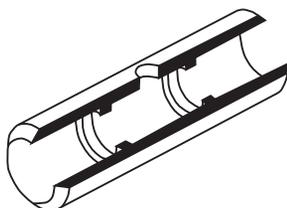
Description			Part No.
GTA 110 Deuterium furnace operating supplies kit			190024900
GTA 110 Zeeman furnace operating supplies kit			190025000
Kit Contents	Kit Quantity	Unit	Part No.
Graphite electrodes For GTA-95/96/97/100/110	2	2/pk	6310001600
Graphite electrodes For GTA-96/100/110 Zeeman	2	2/pk	6310001700
Notched partitioned tube for fork	5	10/pk	6310002300
Forked pyrolytic graphite platforms	5	10/pk	6310002400
Syringe, 100 $\mu$ L			4710002300
Plunger for 100 $\mu$ L syringe, PTFE tipped			4710003100
Capillary assembly		5/pk	9910032300
Glass beakers, 25 mL		5/pk	6610008200
Sample vials, 2 mL, conical polyethylene	2	1000/pk	9910028200



Omega platform tubes, 6310003700



Plateau tubes, 6310001100



Partitioned tubes, 6310001200

## Graphite Tubes and Platforms

- High purity graphite reduces spurious absorption from trace contaminants and improves signal-to-noise
- Every tube is hand-checked for reproducible and reliable results
- Perform fewer repeats and increase productivity

Graphite tubes are quality tested to ensure each batch passes our demanding performance specifications for contamination, sensitivity, precision, electrical resistance and lifetime.

Omega platform tubes combine ease-of-use with perfect atomization: the integrated platform ensures the perfect thermal profile to produce dense atom clouds for good signal-to-noise ratios and the best detection limits. Platforms prevent premature atomization of volatile elements such as lead, selenium and arsenic. Omega tubes with an integrated platform can be used straightaway, while notched platforms provide continuity with older methods.

Use partitioned tubes for general purpose work or multiple elements.

### Graphite Tubes and Platforms

Description	Unit	Part No.
Omega platform tubes, pyrolytically coated	10/pk	6310003700
Solid pyrolytic graphite platforms Only for plateau tubes, 6310001100	10/pk	6310001300
Plateau tubes, pyrolytically coated Only for pyrolytic platforms, 6310001300	10/pk	6310001100
Partitioned tubes, pyrolytically coated	10/pk	6310001200



Graphite electrodes for GTA 120, 6310003400



Graphite electrodes, 6310001600



Graphite shroud for GTA 120, 6310003100



Graphite shroud for GTA 120 Zeeman, 6310003600



Electrode extractor tool, 9910031200

## Graphite Electrodes

- Spare electrodes maximize uptime
- Good electrical contact ensures optimum performance and maximize tube life

### Graphite Electrodes

Description	Unit	Part No.
Graphite electrodes for GTA 120	2/pk	6310003400
Graphite electrodes for GTA 120 Zeeman	2/pk	6310003500
Graphite electrodes for GTA-95/96/97/100/110	2/pk	6310001600
Graphite electrodes for GTA-96/100/110 Zeeman	2/pk	6310001700

## Graphite Shrouds

### Graphite Shrouds

Description	Part No.
Graphite shroud for GTA 120	6310003100
Graphite shroud for GTA 120 Zeeman	6310003600
Graphite shroud for GTA-95/96/97/100/110	6310001800
Graphite shroud for GTA-96/100/110 Zeeman	6310001900

## Graphite Furnace Tools

### Graphite Furnace Tools

Description	Part No.
Electrode extractor tool for GTA-96/97/100/110/120, 2 draw bars	9910031200
Shroud removal tool for GTA-96/97/100/110/120	9910033300
Electrode extractor tool for GTA-96/100/110/120 Zeeman, 2 draw bars	9910049300
Shroud removal tool for GTA-96/100/110/120 Zeeman	9910050400



Sample vials, 2 mL, 9910028200



Plastic beakers, 9910115600



Glass beakers, 6610008200



Carousel adaptors, 9910054200



Replacement carousel plate, 5410029700



High capacity carousel kit, 9910113100

## Programmable Sampler Dispenser Supplies

### Spares and Consumables for Graphite Furnace AAS

Description	Use With	Part No.
Sample vials, 1.1 mL, polyethylene, 2000/pk	PSD 120 high capacity sample carousel	6610025900
Sample vials, 2 mL, conical polyethylene, 1000/pk		9910028200
Glass beakers, 25 mL, 5/pk	PSD-95/96/97/100	6610008200
Plastic beakers, 10 mL, 5/pk	PSD 120 high capacity carousel	9910115600
Rinse bottle, Nalgene, 1 L	PSD-97/100/120	6610012100
Cap for rinse bottle	PSD-97/100/120	1610094600
Capillary assembly, 5/pk	PSD 120	9910115100
	PSD-95/96/97/100	9910032300
Carousel adaptors, 5/pk	PSD-96/97/100	9910054200
Allows use of 2 mL sample vials in the central carousel locations		
Syringe, 100 $\mu$ L	PSD 120	4710003200
	PSD-95/96/97/100	4710002300
Plunger for 100 $\mu$ L syringe, PTFE tipped		4710003100
Replacement carousel plate	PSD 100/120	5410029700
Replacement carousel plate for 130 sample carousel	PSD 120	5410046300
Capillary viewing mirror	GTA 110/120	9910091200
Capillary viewing mirror kit	GTA-96/97/100	9910032700

### Optional Accessories for Graphite Furnace AAS

Description	Use With	Part No.
GTA viewing and fume extraction accessory	GTA 120	210190000
Mounts on sample compartment to remove fumes from the GTA workhead and improves viewing of the tube for easier alignment; connects to a 150 mm (6 in.) or 125 mm (5 in.) exhaust duct		
High capacity carousel kit	GTA 120	9910113100
Includes carousel disk (130 samples), 1.1 mL vials (2000/pk) and five containers for bulk solutions		
Bubble-free syringe update kit	PSD-97/100	9910116800

## Burners and Nebulizers

### Burners

The Mark 7 burner fits all current AA instruments and the earlier SpectrAA series instruments and is compatible with the Mark V, VI and 7 spray chambers.



Mark 7 air/acetylene burner, 210164000

#### Burners

Description	Part No.
Mark 7 air/acetylene burner	210164000
Mark 7 nitrous oxide/acetylene burner	210164100
Burner cleaner strips, 100/pk	9910053900



Capillary spares kit, 9910024500

#### Nebulizers and Nebulizer Maintenance

Description	Use With	Part No.
Barrel nebulizer, adjustable	Mark V and VI spray chambers	9910043500
Barrel nebulizer, high vacuum	Mark V and VI spray chambers	9910043700
Spare tantalum venturi kit	Mark V and VI spray chambers	9910024400
Pt/Ir capillary spares kit, high vacuum and non high vacuum		9910024500
High solids capillary tubing, 3 m		9910024800
High vacuum capillary tubing, 3/pk		9910044000
Nebulizer capillary kit	Mark 7 spray chamber	9910093000
Nebulizer cleaning wire, 3 x 0.9 m lengths		9910024700
Nebulizer O-ring kit		9910035200



High solids capillary tubing, 9910024800

## Mark 7 Flame Atomization System Operating Kit

Typical operation supplies required for moderate use of Flame Atomic Absorption Spectrometer Systems with Mark 7 spray chamber.

### Mark 7 Flame Atomization System Operating Kit

Description	Unit	Part No.
Mark 7 operating supplies kit		190034100
<b>Kit Contents</b>		
Venturi nebulizer		1610117390
Nebulizer capillary kit		9910093000
Nebulizer block, including integrated nebulizer		9910093100
Glass impact beads	5/pk	9910025700
High solids capillary tubing, 3 m		9910024800
O-ring kit for aqueous samples		9910093400
Mixing paddles, fluorinated	5/pk	9910093600
Burner cleaner strips	100/pk	9910053900

## Mark 7 Spray Chambers

- Fit organic resistant O-rings to ensure organic compatibility
- Simple-to-use twist and lock assembly makes for easy cleaning and routine maintenance
- Flexible operation with the capability to tune performance using the externally adjustable impact bead, fit mixing paddles for better precision, or both

This spray chamber has inert construction making it suitable for use with aqueous and organic solutions.

### Mark 7 Spray Chambers



Complete Mark 7 spray chamber assembly,  
110634490

Description	Part No.
Nebulizer capillary kit	9910093000
Glass impact beads, 5/pk	9910025700
Mixing paddles, fluorinated, 5/pk	9910093600
O-ring kit for aqueous samples	9910093400
O-ring kit for organic samples	9910093500
Nebulizer block, including integrated nebulizer	9910093100
Kit, fluorinated liquid trap, float and magnet	9910105800
Drain tubing for aqueous solutions per meter, 2 m length required	3710009200
Pressure relief bung, fluorinated	1610118800
Spray chamber body, fluorinated	6210092000
Venturi extraction tool	7210027700
Nebulizer capillary extraction tool	7210027600
Complete Mark 7 spray chamber assembly	110634490

## Mark VI Flame Atomization System Operating Kit

Typical operation supplies required for moderate use of Flame Atomic Absorption Spectrometer Systems with the Mark VI spray chamber (with aqueous supplies).

### Mark VI Flame Atomization System Operating Kit

Description	Unit	Part No.
Mark VI operating supplies kit		190024800
<b>Kit Contents</b>		
Spare tantalum venturi kit		9910024400
Pt/Ir capillary spares kit, high vacuum and non high vacuum		9910024500
Barrel nebulizer, high vacuum		9910043700
Nebulizer O-ring kit		9910035200
High vacuum capillary tubing	3/pk	9910044000
O-ring/gasket kit		9910026500
Mixing paddles	5/pk	9910063600
Burner cleaner strips	100/pk	9910053900



Liquid trap and float assembly, 110315690



Liquid trap and float assembly, 9910061600



Nebulizer bung assembly, 9910063200



Glass impact beads, 9910025700



PTFE impact beads, 9910053300

## Mark VI Spray Chambers

The Mark VI spray chamber was used with older model instruments. It has many of the design features and benefits of the Mark 7 design. There are two versions – the standard version for normal aqueous samples and the universal version for use with organic samples.

### Mark VI Spray Chambers

Description	Part No.
O-ring/gasket kit	9910026500
Mixing paddles, 5/pk	9910063600
Liquid trap and float assembly	110315690
Drain tubing for aqueous solutions per meter, 2 m length required	3710009200
Nebulizer bung assembly Requires nebulizer	110351990
Complete Mark VI spray chamber assembly Requires nebulizer	110351790

### Mark VI Universal Spray Chamber

Description	Part No.
O-ring/gasket kit	9910045700
Mixing paddles, 5/pk	9910063600
Liquid trap and float assembly	9910061600
Nebulizer bung assembly Requires nebulizer	9910063200
Pressure relief bung	9910063100
Drain tubing for organic solvents, nitrile rubber per meter, 2 m length required	3710011700
Complete universal spray chamber and liquid trap assembly Requires nebulizer	9910061100

### Impact Beads

Description	Use With	Unit	Part No.
Glass impact beads	Mark V/VI/7 spray chambers	5/pk	9910025700
Glass impact beads	Mark IV spray chamber	5/pk	9910021300
PTFE impact beads	Mark V/VI/7 spray chambers	5/pk	9910053300



SPS 3 Autosampler

## SPS 3 Autosampler Supplies

- Fast spectroscopy autosampler for high throughput analytical laboratories
- Productivity boosting features decrease analysis times
- Customizable to improve quality of results and reduce running costs

### SPS 3 Start-up and Operating Supplies Kit

Description	Kit Quantity	Unit	Part No.
SPS 3 start-up and operating supplies kit			190065400
<b>Kit Contents</b>			
0.8 mm ID inert probe, PTFE sleeved			9910111900
Pump tubing, 3-bridged, gray/gray	2	12/pk	3710049000
Silicon tubing, 1 mm ID, per m			3710026400
Nalgene tubing, per m	2		3710031500
Nebulizer capillary tubing, per m	2		2410020500
Rinse reservoir, 12 L			6610011800
Polypropylene tubes, 16 mm OD		1000/pk	190049700
Sample rack for 30 mm OD tubes, 21 positions	3		6610026600
Polypropylene sample tubes, 50 mL		500/pk	190065200

### Optional Accessories for SPS 3



Internal purge kit, 9910120200

Description	Comments	Part No.
Autosampler cover, transparent	Prevents contamination of samples and standards from dust and drafts Has provision for optional purge connection and/or exhaust outlet to enable removal of corrosive or solvent fumes	910245400
Internal purge kit	Includes all components required to purge inside of cover with inert gas Includes flow meter, regulator, tubing and instructions	9910120200
Exhaust port connection	Installs on rear panel of cover and allows safe removal of corrosive or solvent fumes; suitable for connection to 2 in. (50 mm) diameter exhaust ducting	9910130600



Glass test tubes, 18 mm OD, 190049800

## Test Tubes

Description	Unit	Part No.
Polypropylene tubes, 16 mm OD	125/pk	3710051100
	1000/pk	190049700
Glass test tubes, 18 mm OD	500/pk	190049800

## Digestion Caps

Description	Unit	Part No.
Centrifuge tubes, screw capped, 30 mm OD, 50 mL polyethylene	500/pk	190047900

## Probes

Description	Part No.
0.8 mm ID inert probe, PTFE sleeved For use with AA instruments (without diluter)	9910111900
1.0 mm ID inert probe, PTFE sleeved For use with diluter	9910112000
1.3 mm ID inert probe, PTFE sleeved	9910130900



Sample rack, 6610026400



Rack overlay kit, 6610026100

## Racks

Description	Part No.
<b>Sample Racks</b>	
Sample rack for 13 mm OD tubes, 90 positions	6610026400
Sample rack for 16 mm OD tubes, 60 positions	6610025400
Sample rack for 20 mm OD tubes, 40 positions	6610025500
Sample rack for 25 mm OD tubes, 24 positions	6610026500
Sample rack for 30 mm OD tubes, 21 positions	6610026600
<b>Spare Standards Racks</b>	
Sample rack for 16 mm OD tubes, 11 positions	810166900
Sample rack for 29 mm OD tubes, 6 positions	810167000
<b>Rack Overlays for Sample Racks</b>	
Rack overlay kit for 16 mm OD tube rack Allows 60 tubes (13 mm OD) to be used in rack	6610026100
Rack overlay kit for 20 mm OD tube rack Allows 40 tubes (18 mm OD) to be used in rack	6610026000



Rinse reservoir, 6610011800

### Diluter Spares

Description	Part No.
Syringe-to-valve tube kit	9910062700
Replacement tubing kit for auto diluter, screw fittings Includes all tubing and connectors	9910083100
Rinse reservoir, 12 L	6610011800

### Diluter Maintenance Supplies

Description	Part No.
Syringe, 20 mL	4710003000
Syringe-to-valve tube kit	9910062700
Replacement tubing kit for auto diluter, bung fittings Includes all tubing and connectors	9910059100
Replacement tubing kit for auto diluter, screw fittings Includes all tubing and connectors	9910083100

### Tubing

Description	Use With	Part No.
Nalgene tubing, per m	For outlet rinse vessel	3710031500
Pump tubing, 3-bridged, gray/gray, 12/pk	For AA and ICP-OES instruments	3710049000
Pump tubing, 3-bridged, purple/black, 12/pk	For UV-Vis instruments	3710052000
Silicon tubing, 1 mm ID, per m	For connecting RSA to autosampler and/or flow cells	3710026400
Replacement spill tray		6610025100



Replacement spill tray, 6610025100



Constant pressure head bottle, rectangular,  
110533590

## SIPS 10/20 Supplies

The Sample Introduction Pump System (SIPS) is an innovative sample introduction and dilution system for flame AA that eliminates the task of manual preparation of multiple calibration standards, providing fast, accurate on-line dilution of over range samples.

### SIPS 10/20 Maintenance Supplies

Description	Part No.
SIPS 10/20 pump tubing, 6/pk	9910075900
Tubing kit, to connect mariotte bottle to tee piece	9910076100
Constant pressure head bottle, rectangular, 1 L	110766690
Constant pressure head bottle, rectangular, 500 mL	110533590
Pump bands, 10/pk	9910077600
SIPS 10 2-way tee piece assembly	110651090
SIPS 20 3-way tee piece assembly	110585790

## Hydride Modules

The Vapor Generation Accessory (VGA 77) is ideal for parts per billion determination of Hg and the hydride-forming elements.



Flow through mercury absorption cell, 9910040700



Tubing and connector kit, 9910061900



Tubing, VGA-76/77, 3710026390

### Hydride Modules

Description	Part No.
AA hydride module VGA 77	9910062100
ICP hydride module VGA 77P	9910062200

### Absorption Cells

Description	Use With	Part No.
Flow through mercury absorption cell, single cell	VGA-76/77	9910040700
Hydride absorption cells, quartz	VGA-76/77	9910040000

### Tubing

Description	Use With	Part No.
Peristaltic pump tubing, black/black, 12/pk	VGA-76/77	3710027200
Sample pump tubing, purple/black, 12/pk	VGA-76/77	3710027300
Tubing and connector kit	VGA 77	9910061900
Tubing kit	VGA 77	9910083400
Tubing	VGA-76/77	3710026390
Gas-liquid separator to absorption cell		
Tubing and connector kit	VGA-76	9910039900

### Gas-liquid Separators

Description	Use With	Part No.
Gas-liquid separator	VGA 77 for AA	9910071100
	VGA 77P for ICP	9910062000
	VGA-76	9910040200

### VGA-76/77 Maintenance Supplies

Description	Part No.
Pump tube beds kit	9910050700
VGA cell support for Mark 7 burner	110654990
VGA cell support for Mark VI burner	110375990



715 Series ICP-OES Spectrometer

## ICP-OES

Agilent's ICP-OES series are compatible with a range of accessories and supplies designed to extend the capabilities of the instruments.

## Spray Chambers and Brackets

- Single-pass glass cyclonic spray chamber for good signal-to-noise performance with excellent washout
- Double-pass glass cyclonic spray chamber provides improved plasma stability with organic and high TDS samples
- Sturman-Masters spray chamber is inert and minimizes interferences and improves stability with high TDS samples

### Sample Compartment Kits

Description	Part No.
Sample compartment O-ring kit Includes all O-rings for spray chamber area, demountable torch and ASA	9910057200
Sample compartment/torch box tube connection kit Includes all tubing for spray chamber area and spare nipples for drain (excluding pump tubing)	9910057100

**Spray Chambers and Brackets**

<b>Description</b>	<b>Use With</b>	<b>Part No.</b>
Single-pass glass cyclonic spray chamber for axial ICP-OES Needs mounting bracket		2010081700
Double-pass glass cyclonic spray chamber, suitable for all ICP-OES Needs mounting bracket		7910043700
Cooled double-pass glass cyclonic action spray chamber with cooling gallery Includes mounting bracket for Liberty Series I/II, Vista and 700 Series ICP-OES instruments; requires, but does not include, a refrigerated water cooler for subambient operation	Ideal for use with highly volatile organic solvents	9910070400
Sturman-Masters spray chamber, white	Samples dissolved in hydrofluoric acid (HF) or when using the V-groove nebulizer for fusions or slurries	110593190
Bracket for mounting glass cyclonic spray chambers	715/725/735 radial, Vista-PRO radial and early axial, Vista-MPX radial and Liberty Series II radial and early axial models	110611700
	710/720/730 axial, Vista-PRO axial, Vista-MPX axial and Liberty Series II axial models	110665200
Bracket for mounting Sturman-Masters spray chamber	715/725/735 radial, Vista-PRO radial and early axial, Vista-MPX radial models and Liberty Series II radial and early axial models	410298400
	710/720/730 axial, Vista-PRO axial, Vista-MPX axial and Liberty Series II axial models	410328600



Bracket for mounting glass cyclonic spray chambers,  
110611700



Bracket for mounting Sturman-Masters spray  
chamber, 410298400



Bracket for mounting Sturman-Masters spray  
chamber, 410328600

## Nebulizers and Accessories

- Manufactured to fine tolerances for reproducible and stable sample uptake
- Tight specifications deliver fine droplets for best signal intensity and optimum signal-to-noise
- Fewer repeats means less downtime and improved productivity

### Nebulizers and Accessories

Description	Application	Part No.
Concentric glass nebulizer (Seaspray) Includes sample and gas inlet fittings	Routine analysis of samples to 20% total dissolved solids (TDS)	2010096400
K-style (Conikal) concentric glass nebulizer Includes sample and gas inlet fittings	Routine analysis of samples to 5% TDS	2010106800
Micro-concentric glass nebulizer (MicroMist), 0.4 mL/min uptake Includes sample and gas inlet fittings	Small sample volumes	2010102100
Inert V-groove nebulizer kit for use with Sturman-Masters spray chamber Includes tubing and fittings	Samples with hydrofluoric acid, fusions, slurries or >20% TDS	9910057400
Concentric glass slurry nebulizer	Slurry samples with particles to 150 µm, or >20% TDS	2010097600
High flow concentric glass slurry nebulizer for Liberty Series II axial systems	Slurry samples or those >20% TDS	2010097700
High flow K-style (Conikal) concentric glass nebulizer for Liberty Series II axial systems Includes sample and gas inlet fittings	Routine analysis of samples to 5% TDS	2010081600
Sample inlet (EzyFit) fitting for concentric glass nebulizer on axial ICP-OES, 0.75 mm ID x 1.3 mm OD capillary tubing, 10/pk		9910107700
Sample inlet (EzyFit) fitting for concentric glass nebulizer on radial ICP-OES, 0.75 mm ID x 1.6 mm OD capillary tubing, 10/pk	Suitable for SVS1 accessory	1610136400
Gas inlet connector (EzyLok) for concentric glass nebulizer		9910127800
Y piece connector for online addition of internal standard/ionization buffer		1610132400
Nebulizer bung O-ring kit, 7/32 in. ID x 11/32 in. OD		6910008200
Nalgene tubing, per m, 1/8 in. ID x 1/4 in. OD	Connects argon supply to nebulizer	3710031500



Y piece connector,  
1610132400



High flow K-style (Conikal) concentric glass  
nebulizer, 2010081600



Gas inlet connector (EzyLok),  
9910127800



Inert V-groove nebulizer kit,  
9910057400

# Torches

- Light easily and stay lit, reducing downtime
- Even and stable plasma delivers reproducible results
- Guard your instrument warranty to protect your investment

## One Piece Axial Torches

Description	Application	Part No.
Low flow quartz torch with 2.4 mm ID injector tube	Routine analysis of aqueous samples <10% TDS	2010090400
Low flow quartz torch with 0.8 mm ID injector tube	Routine analysis of volatile organic solvents, e.g. gasoline	2010104700
Low flow quartz torch with 1.4 mm ID injector tube	Routine analysis of organic solvents, e.g. kerosene, xylene and white spirit	2010104800
High solids torch with patented injector design, 2.4 mm ID	Routine analysis of samples to 25% TDS	2010094800
Extended high solids torch standard length axial torch with patented injector design, 2.4 mm ID	Routine analysis of samples to 25% TDS	2010104600
Sheath gas high solids torch with patented injector design, 2.4 mm ID Used with the AGM-1 oxygen addition accessory (10055900) for better performance than the extended high solids torch	Routine analysis of samples to 25% TDS	2010122400

## One Piece Radial Torches

Description	Application	Part No.
Low flow quartz torch with 1.4 mm ID injector tube	Routine analysis of aqueous samples <10% TDS	2010069690
Low flow quartz torch with 1.4 mm ID injector tube, annealed for greater strength	Routine analysis of organic solvents, e.g. kerosene, xylene and white spirit	2010117400
High solids torch with patented injector design, 1.8 mm ID	Routine analysis of samples to 25% TDS	2010117500



Sheath gas high solids torch, 2010122400



Spare quartz torch bonnet, 2010070790



Torch alignment tool, 7210020700



Spare semi-demountable quartz torch body, 2010072900



Injector holder kit, 9910057300

### Torch Spares

Description	Part No.
Spare quartz torch bonnet for radial ICP-OES	2010070790
Torch alignment tool for radial ICP-OES	7210020700
GazFit fittings for one-piece and semi-demountable ICP-OES torches, 4/pk	9910107100
Transfer tube FEP cyclone spray chamber for radial ICP	7910051290
Transfer tube FEP Sturman-Masters spray chamber for radial ICP	7910051490
Transfer tube FEP for axial ICP	7910051590
Silicon tubing, 3/16 in. ID x 5/16 in. OD, per m	2410023800

### Cones for Axial ICP-OES

Description	Part No.
Finger nut for cone	1510220200
Pre-optics cone for Vista/700 Series axial ICP-OES	3610007300
Pre-optics cone for Liberty Series axial ICP-OES	3610006200
Esteele cleaning powder	8110002800
For cleaning interface cone on axially-viewed ICP-OES	

### Semi-demountable Torches

Description	Application	Part No.
Semi-demountable inert axial torch assembly kit	Samples with free HF when used with an inert alumina injector (2410067590); for volatile organic solvents, use narrow bore 0.8 mm ID quartz injector (2010077500)	9910084700
Semi-demountable inert radial torch assembly kit	Samples with free HF when used with an inert alumina injector (2410067590); for volatile organic solvents, use narrow bore 0.8 mm ID quartz injector (2010077500)	9910056800

### Spares for Semi-demountable Torches

Description	Part No.
Spare semi-demountable quartz torch body for axial ICP-OES	2010083400
Spare semi-demountable quartz torch body for radial ICP-OES	2010072900
Injector holder kit	9910057300
Includes O-rings	
Alumina injector tube, 1.8 mm	2410067590
Quartz injector tube, 1.4 mm	9910057000
Quartz injector tube, 0.8 mm	2010077500

# Tubing

## Peristaltic Pump Tubing

- PVC Solva (solvent flex) for common organic solvents such as kerosene, xylene and white spirit
- Marprene tubing for ketone-based solvents such as MIBK and DIBK
- Viton tubing for longer operating life with strong acids and most organics

### PVC Tubing for Aqueous Samples

Description	Part No.
Peristaltic pump tubing, orange/white	3710046900
Peristaltic pump tubing, black/black	3710027200
Peristaltic pump tubing, white/white	3710034400
Peristaltic pump tubing, gray/gray	3710034500
Peristaltic pump tubing, blue/blue	3710034600
<b>Replacement Tubing for Aqueous Samples</b>	
Tubing, spray chamber to torch, per m	3710033400
Tubing, spray chamber to peri-pump waste line (Sturman-Masters spray chamber), per m	3710033900
Tubing, spray chamber to peri-pump waste line (glass cyclonic spray chamber), per m	3710024600
Nebulizer capillary tubing, per m	2410020500

### PVC Solva Tubing for Low Volatile Organic Samples

Description	Part No.
Peristaltic pump tubing, black/black	3710034800
Peristaltic pump tubing, white/white	3710035000
Peristaltic pump tubing, gray/gray	3710035200
Peristaltic pump tubing, purple/black	3710047000
<b>Replacement Tubing for Low Volatile Organic Samples</b>	
Tubing, spray chamber to torch, per m	3710037800
Tubing, spray chamber to peri-pump waste line (Sturman-Masters spray chamber), per m	3710035300
Tubing, spray chamber to peri-pump waste line (glass cyclonic spray chamber), per m	3710035400
Nebulizer capillary tubing, per m	2410020500

**Marprene Tubing for Ketone-Based Organic Samples**

<b>Description</b>	<b>Part No.</b>
Peristaltic pump tubing, orange/yellow	3710044000
Peristaltic pump tubing, black/black	3710044100
Peristaltic pump tubing, white/white	3710044200
Peristaltic pump tubing, gray/gray	3710044300
Peristaltic pump tubing, blue/blue	3710044400

**Replacement Tubing for Ketone-Based Organic Samples**

Tubing, spray chamber to torch, per m	3710037800
Tubing, spray chamber to peri-pump waste line (Sturman-Masters spray chamber), per m	3710035300
Tubing, spray chamber to peri-pump waste line (glass cyclonic spray chamber), per m	3710035400
Nebulizer capillary tubing, per m	2410020500

**Viton Tubing for Aromatic Organic Samples**

<b>Description</b>	<b>Part No.</b>
Peristaltic pump tubing, orange/yellow	3710043500
Peristaltic pump tubing, black/black	3710043600
Peristaltic pump tubing, white/white	3710043700
Peristaltic pump tubing, gray/gray	3710043800
Peristaltic pump tubing, blue/blue	3710043900

## Internal Standard Kit

The Internal Standard Kit includes the following:

- Standard PVC pump tubing
- EzyFit connectors
- Five Y pieces
- Connecting tubing

**Internal Standard Kit**

<b>Description</b>	<b>Part No.</b>
Internal standard kit 1 with black/black pump tubing	9910124000
Internal standard kit 2 with orange/white pump tubing	9910124100

## Tubing Kits

### Aqueous Samples and High Dissolved Solids

The ICP-OES tubing kit for aqueous samples and high dissolved solids includes:

- Standard PVC pump tubing (one each blue/blue and white/white)
- FEP transfer tube (spray chamber to torch)
- Drain tubing
- Tubing for waste line
- EzyFit connectors
- Nebulizer capillary tubing
- Connectors
- Connecting tubing

### Aqueous Samples and High Dissolved Solids

Description	Use With	Part No.
Aqueous tubing kit 1 – axial	Seaspray/K-style nebulizers and double- or single-pass cyclonic spray chamber	9910123600
Aqueous tubing kit 1 – radial	Seaspray/K-style nebulizers and double- or single-pass cyclonic spray chamber	9910123700
Aqueous tubing kit 2 – axial	V-groove nebulizer and Sturman-Masters spray chamber	9910123800
Aqueous tubing kit 2 – radial	V-groove nebulizer and Sturman-Masters spray chamber	9910123900

## Low Volatile Organic Solvents

The ICP-OES tubing kit for low volatile organic solvents includes:

- PVC Solva pump tubing (one each black/black and white/white)
- FEP transfer tube (spray chamber to torch)
- Drain tubing
- Tubing for waste line
- EzyFit connectors
- Nebulizer capillary tubing
- Connectors
- Connecting tubing

### Low Volatile Organic Solvents

Description	Use With	Part No.
Organics tubing kit 1 – axial	Seaspray nebulizer and double-pass cyclonic spray chamber	9910124200
Organics tubing kit 1 – radial	Seaspray nebulizer and double-pass cyclonic spray chamber	9910124300
Organics tubing kit 2 – axial	V-groove nebulizer and Sturman-Masters spray chamber	9910124400
Organics tubing kit 2 – radial	V-groove nebulizer and Sturman-Masters spray chamber	9910124500

## Aromatic Organic Solvents

The ICP-OES tubing kit for aromatic organic solvents includes:

- Viton pump tubing (one each black/black and white/white)
- FEP transfer tube (spray chamber to torch)
- Drain tubing
- Tubing for waste line
- EzyFit connectors
- Nebulizer capillary tubing
- Connectors
- Connecting tubing

### Aromatic Organic Solvents

Description	Use With	Part No.
Organics tubing kit 3 – axial	Seaspray nebulizer and double-pass cyclonic spray chamber	9910124600
Organics tubing kit 3 – radial	Seaspray nebulizer and double-pass cyclonic spray chamber	9910124700
Organics tubing kit 4 – axial	V-groove nebulizer and Sturman-Masters spray chamber	9910124800
Organics tubing kit 4 – radial	V-groove nebulizer and Sturman-Masters spray chamber	9910124900

## Ketone-Based Organic Solvents

The ICP-OES tubing kit for ketone-based organic solvents includes:

- Marprene pump tubing (one each black/black and white/white)
- FEP transfer tube (spray chamber to torch)
- Drain tubing
- Tubing for waste line
- EzyFit connectors
- Nebulizer capillary tubing
- Connectors
- Connecting tubing

### Ketone-Based Organic Solvents

Description	Use With	Part No.
Organics tubing kit 5 – axial	Seaspray nebulizer and double-pass cyclonic spray chamber	9910125000
Organics tubing kit 5 – radial	Seaspray nebulizer and double-pass cyclonic spray chamber	9910125100
Organics tubing kit 6 – axial	V-groove nebulizer and Sturman-Masters spray chamber	9910125200
Organics tubing kit 6 – radial	V-groove nebulizer and Sturman-Masters spray chamber	9910125300

## Volatile Organic Samples

The ICP-OES tubing kit for volatile organic samples includes:

- Viton pump tubing (one each black/black and white/white)
- FEP transfer tube (spray chamber to torch)
- Drain tubing
- Tubing for waste line
- EzyFit connectors
- Nebulizer capillary tubing
- Connectors
- Connecting tubing

### Volatile Organic Samples

Description	Use With	Part No.
Volatile organics tubing kit – axial	Seaspray nebulizer, cooled spray chamber and full length torch	9910125400
Volatile organics tubing kit – radial	Seaspray nebulizer, cooled spray chamber and annealed (organics) torch or semi-demountable torch	9910125500

## Applications Kits

### High Dissolved Solids

The application kits for high dissolved solids include:

- Nebulizer
- Spray chamber
- Mounting bracket
- Patented high-solids torch (unless otherwise stated)
- Argon saturator accessory
- All necessary tubing

#### High Dissolved Solids

Description	Nebulizer, Spray Chamber	Part No.
High solids kit 1 – axial	Seaspray nebulizer, double-pass glass cyclonic spray chamber	9910125600
High solids kit 1 – radial	Seaspray nebulizer, double-pass glass cyclonic spray chamber	9910125700
High solids kit 2 – axial	V-groove nebulizer, Sturman-Masters spray chamber	9910125800
High solids kit 2 – radial	V-groove nebulizer, Sturman-Masters spray chamber	9910125900

## Inert Sample Introduction Systems

The inert sample introduction systems kit is for solutions with free HF and includes:

- V-groove nebulizer
- Double-pass Sturman-Masters spray chamber
- Mounting bracket
- Semi-demountable torch with 1.8 mm ID alumina injector
- All necessary tubing

### Inert Sample Introduction Systems

Description	Nebulizer, Spray Chamber	Part No.
Inert kit – axial	V-groove nebulizer, Sturman-Masters spray chamber	9910126000
Inert kit – radial	V-groove nebulizer, Sturman-Masters spray chamber	9910126100
Inert kit – radial	Excludes spray chamber and mounting bracket	9910126200

## Ketone-Based Organic Solvents

The application kits for ketone-based organic solvents include:

- Nebulizer
- Spray chamber
- Mounting bracket
- One-piece torch with 1.4 mm ID injector
- All necessary solvent flexible PVC tubing

AGM 1 oxygen accessory (P/N 10055900) is recommended when analyzing organic solvents on axial ICP-OES.

### Ketone-Based Organic Solvents

Description	Nebulizer, Spray Chamber	Part No.
Organics kit 5 – axial	Glass concentric (Conikal) nebulizer, double-pass glass cyclonic spray chamber	9910127100
Organics kit 5 – radial	Glass concentric (Conikal) nebulizer, double-pass glass cyclonic spray chamber, annealed torch	9910127200
Organics kit 6 – axial	V-groove nebulizer, double-pass Sturman-Masters spray chamber	9910127300
Organics kit 6 – radial	V-groove nebulizer, double-pass Sturman-Masters spray chamber, annealed torch	9910127400

## Volatile Organics

The volatile organics kit reduces vapor pressure that can destabilize the plasma and lead to signal loss. The kit includes:

- Glass concentric (Conikal) nebulizer
- Water-cooled spray chamber
- Mounting bracket
- One-piece torch with 0.8 mm ID injector
- All necessary Viton and solvent flexible PVC tubing

AGM 1 oxygen accessory (P/N 10055900) is recommended when analyzing volatile organic solvents. Cooled spray chamber requires a refrigerated, recirculating water cooler able to cool fluid down to -10°C. For analysis of volatile organic solvents such as gasoline and naphtha.

### Volatile Organics

Description	Nebulizer, Spray Chamber	Part No.
Volatile organics kit – axial	Glass concentric (Conikal) nebulizer, water-cooled spray chamber	9910127500
Volatile organics kit – radial	Glass concentric (Conikal) nebulizer, water-cooled spray chamber, annealed torch	9910127600

## Common Organic Solvents

The application kits for common organic solvents include:

- Nebulizer
- Spray chamber
- Mounting bracket
- One-piece torch with 1.4 mm ID injector
- All necessary Marprene and solvent flexible PVC tubing

AGM 1 oxygen accessory (P/N 10055900) is recommended when analyzing organic solvents on axial ICP-OES.

### Common Organic Solvents

Description	Application	Nebulizer, Spray Chamber	Part No.
Organics kit 1 – axial	Common, low volatility organic solvents, e.g. kerosene, xylene and white spirit	Glass concentric (Conikal) nebulizer, double-pass glass cyclonic spray chamber	9910126300
Organics kit 1 – radial	Common, low volatility organic solvents, e.g. kerosene, xylene and white spirit	Glass concentric (Conikal) nebulizer, double-pass glass cyclonic spray chamber, annealed torch	9910126400
Organics kit 2 – axial	High particulate samples dissolved in common, low volatility organic solvents, e.g. kerosene, xylene and white spirit	V-groove nebulizer, double-pass Sturman-Masters spray chamber	9910126500
Organics kit 2 – radial	High particulate samples dissolved in common, low volatility organic solvents, e.g. kerosene, xylene and white spirit	V-groove nebulizer, double-pass Sturman-Masters spray chamber, annealed torch	9910126600



## ■ ICP-MS

As ICP-MS has evolved to become the premier technique for trace metals analysis, Agilent has been at the forefront of development and design, introducing many important innovations. With the 7700 Series ICP-MS, Agilent continues to revolutionize the ICP-MS landscape by increasing performance, reducing interferences and improving productivity – all while making the technology easier to use, maintain and service.

ICP-MS Maintenance Schedule		
Item	Actions/Comments	Typical Schedule
Argon gas	Check argon gas pressure and volume	Daily
Drain vessel	Check, empty if required	
Peristaltic pump tubing	Check for damage/deterioration	
Sampling cone, skimmer cone	Check orifice for foreign matter, deformation and enlargement Clean if required	Weekly
Foreline pump (rotary pump)	Check oil level and color Check mist filter for presence of oil	Monthly
Nebulizer	Run nebulizer test, take appropriate action as indicated	
Shield contact	Clean	
Cooling water	Check water level and condition	
Extraction/Omega lenses	Clean	3 - 6 Months
Other ion lenses	Clean	6 Months
Foreline pump (rotary pump)	Change oil	
Rotary pump oil mist filter	Check/replace mist filter	Annually
Penning gauge (7500 Series)	Clean and replace when necessary	
Water strainer	Check and clean	
Octopole	Clean	
Sample introduction area, e.g. spray chamber, end cap	Clean	Periodically
Torch	Clean and replace when necessary	
Electron multiplier	Evaluate and replace when necessary	
Plasma gas, auxiliary gas tubing	Check and replace when necessary	
Argon gas filter	Replace 2 years after installation	
Graphite gasket	Replace when surface or shape is damaged	

# Gas Line Supplies

## Gas Line Supplies

Description	Specifications	Use	Unit	7700 Part No.	7500 Part No.
Plasma/aux tubing with inner sleeve	0.2 m		2/pk	G3280-67023	
Connectors for plasma/aux gas lines, PTFE	6 mm and 4 mm	For gas line connection to torch	1/ea	G1820-65027	G1820-65027
Inner sleeve for carrier/aux/blend gas line	CTFE	For gas line connection to connector	5/pk		5042-0922
Inner sleeve for plasma gas line	CTFE	For gas line connection to connector	5/pk		5042-0923
Carrier/make-up/dilution gas tubing				G3280-67022	
Gas connector for dilution gas port		For dilution gas line connection to dilution port		0100-2583	
Argon gas tubing kit	1/4 in. OD, 5 m, inner sleeve, connector	For external line			G1820-65023
Tubing for carrier/blend gas, PTFE	3 mm ID, 4 mm OD, 35 cm	For gas line connection to nebulizer	2/pk		G1833-65414
Plasma and auxiliary gas line tubing	3.17 mm ID, 6.35 mm OD, 35 cm (plasma) 2.38 mm ID, 3.96 mm OD, 35 cm (aux)	For gas line connection to torch	2/pk		G3270-65021
Argon humidifier				G3270-80029	G3270-80029
Ar gas filter				G1820-80341	G1820-80341
Ar clean gas filter		For semicon applications		5064-8092	5064-8092
Ar gas tubing kit for 7700x/e		For external line		G3280-60160	
Ar gas tubing kit for 7700s		For external line		G3280-60163	
Stainless steel tubing	1/8 in. OD, 6 m	For external cell gas line		G3270-65035	G3270-65035

## Ultra Clean ICP-MS Traps

Description	Part No.
Triple filter cartridge for Super Clean Gas Purification systems, baseplate type	5182-9705
Replacement O-rings for gas filters, 8/pk, four each of two sizes	5182-3423

## Gas Regulators – US only

Description	Part No.
Regulator for Helium gas	0101-1398
Regulator for Hydrogen gas	0101-1399
Regulator for Argon gas	0101-1400
Regulator for NH <sub>3</sub> /He gas	5188-5374

## Gas Line Connectors for 7500 Series

Description	Specifications	Use	7500 Part No.
Connector for end cap and gas line		For gas line connection to nebulizer	5063-5263
Connectors for plasma/aux gas lines, PTFE	6 mm and 4 mm	For gas line connection to torch	G1820-65027
Connector for carrier gas line, PTFE	4 mm tubing, includes ferrule and O-ring	For gas line connection to Babington Nebulizer	G1820-65214
Connector for carrier gas line, polypropylene	4 mm tubing, includes ferrule and O-ring	For gas line connection to Concentric Nebulizer	G1820-65052
Connector for blend gas line, polypropylene, 2/pk	4 mm tubing	For gas line connection to Crossflow/ Babington Nebulizer	G1820-65119
Connector for makeup gas line, polypropylene	4 mm tubing, Luer type	For gas line connection to Crossflow/ Babington Nebulizer	G1833-65477
Union fitting	4 mm tubing	For PFA Concentric Nebulizer	5064-8078



Connectors for plasma/aux,  
G1820-65027



Polypropylene connector,  
G1820-65052



PTFE connector, G1820-65214



Connector for blend gas line,  
G1820-65119

## Sample Introduction Supplies

### Sample Line Supplies

Description	Specifications	Use	Unit	7700 Part No.	7500 Part No.
Peri-pump sample tubing, Tygon	1.02 mm ID, 40 cm	Standard for sample introduction	12/pk	G1833-65569	G1833-65569
Peri-pump tubing for ISTD, flared end, 2 stopper, blue/orange	0.25 mm ID	Standard for 7700 Series	12/pk	G3280-67047	G3280-67047
Peri-pump tubing for ISTD, flared end, 2 stopper, red/orange	0.19 mm ID	Standard for 7500 Series	12/pk	G3280-67008	G3280-67008
Peri-pump tubing, Fluran, 3 stopper, yellow/blue	1.52 mm ID	For xylene analysis	12/pk	5042-4799	5042-4799
Peri-pump tubing, silicone	1.02 mm ID, 16 in. L		6/pk	G1820-65217	G1820-65217
Peri-pump ISTD tubing, Tygon	0.19 mm ID, 40 cm		12/pk		G1833-65571
Peri-pump drain tubing, Ismaprene	1.52 mm ID, 0.75 wall, 40 cm		12/pk		G1820-65216
Peri-pump drain tubing, Ismaprene, stronger stops	1.52 mm ID, 0.75 wall, 40 cm		12/pk	G1833-65570	G1833-65570
Sample tubing, PFA	0.5 mm ID, 1.6 mm OD, 5 m			G1820-65105	G1820-65105
	0.2 mm ID, 1.6 mm OD, 70 cm		3/pk	G1833-65573	G1833-65573
	0.15 mm ID, 1.6 mm OD, 70 cm		3/pk	G1833-65572	G1833-65572
Sample tubing with PEEK guide, PFA	0.3 mm ID, 1.6 mm OD, 70 cm		5/pk	G1820-65531	G1820-65531
	0.2 mm ID, 1.6 mm OD, 70 cm		5/pk	G1820-65527	G1820-65527
	0.15 mm ID, 1.6 mm OD, 70 cm		5/pk	G1820-65526	G1820-65526
ISTD tubing, PFA	0.3 mm ID, 1.6 mm OD, 3 m	For online ISTD addition		G1820-65478	G1820-65478
Online ISTD addition kit				G3280-60590	G1833-65071
Plastic tubing cutter				8710-1930	8710-1930
Sample tray				G3280-40103	
Plug for cross joint			3/pk	G3138-65129	G3138-65129
PTFE nut for cross joint		For 1.6 mm OD tubing	10/pk	5064-8023	5064-8023
Front and back ferrule		For 1.6 mm OD tubing	10/pk	5064-8024	5064-8024



Sample tubing, PFA, G1820-65105



Peri-pump sample tubing, Tygon, G1833-65569

## Nebulizers and Supplies

Description	Specifications	Use	Unit	7700 Part No.	7500 Part No.
MicroMist Nebulizer	Borosilicate glass	Standard on 7700x/e and 7500cx/ce. When ordered for the 7500a, the spray chamber end cap (G1833-65475) is also required.		G3266-65003	G3266-65003
Sample tubing	0.25 mm ID, 700 mm, with connector	For MicroMist Nebulizer	10/pk	G3266-80010	G3266-80010
Sample tubing	0.5 mm ID, 700 mm, with connector	For MicroMist Nebulizer	10/pk	G3266-80011	G3266-80011
Carrier gas connector		For MicroMist Nebulizer		G3266-80015	G3266-80015
Nebulizer cleaner		For MicroMist Nebulizer		G3266-80020	G3266-80020
MicroFlow Nebulizer	PFA, 200 µL/min			G3139-65100	G3139-65100
MicroFlow Nebulizer with I-AS probe	PFA, 200 µL/min	Standard on 7700s and 7500s		G3139-65102	G3139-65102
MicroFlow Nebulizer	PFA, 20-50 µL/min			G3139-65106	G3139-65106
MicroFlow Nebulizer with I-AS probe	PFA, 20-50 µL/min			G3139-65108	G3139-65108
Carrier gas line connector		For MicroFlow Nebulizer	2/pk	G1833-65583	G1833-65583
Mira Mist Nebulizer	PTFE			G3161-80000	G3161-80000
Mira Mist Nebulizer	PEEK	For high solids applications such as environmental, geological, etc. Not for semiconductor use since it does not self aspirate. When ordered for the 7500a, the spray chamber end cap (G1833-65475) is also required (included with 7500cx/cs).		G3161-80001	G3161-80001
Babington Nebulizer	Includes Viton O-ring, PTFE sample tubing, and connector	Use to introduce samples with high matrix and high total salts. Clean when contaminated or when orifices are clogged.			G1820-60453
End cap for Babington Nebulizer, polypropylene	Includes Viton O-rings	Replace when memory effects do not disappear after cleaning. Insert nebulizer in middle of end cap all the way through. Attach end cap to spray chamber with "TOP" mark facing up.			G1833-65476
Babington Nebulizer removal tool					G1820-65345

(Continued)



MicroMist Nebulizer, G3266-65003

## Nebulizers and Supplies

Description	Specifications	Use	Unit	7700 Part No.	7500 Part No.
Concentric Nebulizer, Pyrex	Use with P/N G1820-65052 Argon gas connector, P/N G1820-60160 Connector kit, P/N G1820-65121 end cap	Use with clean samples only. Not resistant to hydrochloric acid. Clean with a 5% HNO <sub>3</sub> (v/v) bath; do not use ultrasonic bath.		G1820-65030	G1820-65030
Concentric Nebulizer, quartz	Use with P/N G1820-65337 Quartz spray chamber, P/N G1820-80237 Quartz connecting pipe	Recommended for trace analysis of clean samples. Lower contamination level than Pyrex. Clean using 5% HNO <sub>3</sub> (v/v) bath; do not use ultrasonic bath.		G1820-65138	G1820-65138
Connector for carrier gas line, polypropylene	4 mm tubing, includes ferrule and O-ring	For gas line connection to Concentric Nebulizer		G1820-65052	G1820-65052
Sample tubing with connector, PTFE	Tool included	For Babington Nebulizer, replace when heavily contaminated by high matrix samples.			G1820-65276
Sample line connector	Includes Viton O-ring	Connects Concentric Nebulizer with sample line. Port with large hole connects to nebulizer; smaller port connects with sample tubing.		G1820-60160	G1820-60160
Union fitting	4 mm tubing	For PFA Concentric Nebulizer		5064-8078	5064-8078
Ferrule and Viton O-ring kit for carrier gas line connector		For Babington/Concentric Nebulizer		G1820-65533	G1820-65533
End cap for Concentric Nebulizer, PTFE	Includes Viton O-rings	Connects the Concentric Nebulizer (Pyrex or Quartz) with the spray chamber. For MicroMist, MicroFlow, and other concentric nebulizers.			G1833-65475
O-rings for Babington Nebulizer, Viton		Used to create seal between Babington Nebulizer and end cap.	4/pk		G1820-65199
O-ring kit for Concentric Nebulizer, Viton	2 sizes, 10 each		20/pk	G1820-65491	G1820-65491
O-rings for Concentric Nebulizer, for organic solvents (3 types)			4/pk	G1820-65520	G1820-65520
O-rings for end cap, Viton		Use for the end cap of the Babington Nebulizer, Cross Flow Nebulizer and Concentric Nebulizer.	5/pk		G1820-65198
O-rings for end cap, for organic solvents			2/pk		G1820-65518
CrossFlow Nebulizer	Includes bushing, carrier gas line connector, blend gas line connector, sample tubing, and gas line tubings with inner sleeves	Standard nebulizer for the inert kit. Resistant to hydrofluoric acid. Set carrier gas pressure to 500 kPa (5 kg/cm <sup>2</sup> ). Clean with 5% HNO <sub>3</sub> (v/v) bath. Replace when memory effects remain after cleaning.			G1833-65462

**PFA Inert Sample Introduction Kit Supplies**

<b>Description</b>	<b>7700 Part No.</b>	<b>7500 Part No.</b>
PFA inert kit, sapphire, 2.5 mm ID Torch included	G4912-68000	
PFA inert kit, platinum, 2.5 mm ID Torch included	G4912-68001	
PFA inert kit, sapphire, 1.5 mm ID Torch included	G4912-68002	
PFA inert kit, platinum, 1.5 mm ID Torch included	G4912-68003	
Inert sample introduction kit, sapphire, 2.5 mm ID Torch not included		G3285-80014
Inert sample introduction kit, platinum, 2.5 mm ID Torch not included		G3285-80015
Inert sample introduction kit, sapphire, 1.5 mm ID Torch not included with O <sub>2</sub> port		G3285-80016
Inert sample introduction kit, platinum, 1.5 mm ID Torch not included with O <sub>2</sub> port		G3285-80017
End cap	G3285-80020	G3285-80020
Spray chamber	G3285-80021	G3285-80021
Drain tube	G4912-80014	G3285-80022
Long connector tube	G3285-80024	G3285-80024
Connector tube with gas port	G4912-80016	G3285-80023
O-ring for injection assembly, 10/pk	G3285-80085	G3285-80085
Sapphire injector for PFA, 2.5 mm ID	G3285-80034	G3285-80034
Platinum injector for PFA, 2.5 mm ID	G3285-80035	G3285-80035
Sapphire injector, 1.5 mm ID	G4912-80010	
Sapphire injector with O <sub>2</sub> port for PFA, 1.5 mm ID		G3285-80036
Platinum injector, 1.5 mm ID	G4912-80011	G3285-80037
Torch	G4912-80012	G3285-80050

**PP Inert Sample Introduction Kit Supplies**

<b>Description</b>	<b>7500 Part No.</b>
Spray chamber, polypropylene (sapphire tube)	G1833-65463
Inert torch, quartz, without injector	G1833-65422
Platinum injector for inert torch, 2.0 mm ID	G1833-65409
Platinum injector for inert torch, 2.5 mm ID	G1833-65415
Platinum injector for inert torch, 1.5 mm ID	G1833-65416



Connector rod, dilution, G3270-80024

**HMI Kit Supplies for 7500 Series**

Description	Part No.
Plug for make-up gas connector (for 7700e)	G3270-20067
Inner sleeve	5022-1703
Gas connector	5042-4774
End cap assembly	G3270-60207
Torch, 2.5 mm, 2 projections	G3270-67002
Connector rod, dilution	G3270-80024
Connector rod, straight	G3270-80025
Connector rod, oxygen	G3270-80026

**Spray Chambers**

Description	Use	Unit	7700 Part No.	7500 Part No.
Spray chamber, quartz	Standard for 7700 Series and 7500 Series		G3280-80008	G3280-80008
End cap for spray chamber			G3280-60008	
Connector for gas line at end cap			5042-4775	
Plug for make-up gas connector (for 7700e)			G3270-20067	
End cap nut for nebulizer connection			0535-1082	
Drain tubing assembly			G3280-60555	
Drain tubing	Tubing between peri-pump tubing and drain tank		G1820-65515	G1820-65515
Drain tank, polyethylene, 4L			5042-4769	5042-4769
Drain tank with PVC connector, 1 L			G1820-65016	G1820-65016
Drain tank for organic solvents			G1820-65505	G1820-65505
Drain tubing kit Includes 2 connectors, 1 bushing, 1 tubing (4 mm ID, 12 cm)	Tubing between spray chamber and peri-pump tubing		G1833-65411	G1833-65411
Bushing at spray chamber drain, Viton		5/pk		G1820-65482
Bushing at spray chamber drain, for organic solvents	For use with organic solvents			G1820-65504
Connector for spray chamber drainage, polypropylene				G1820-65503
Spray chamber	For ultra trace B analysis		G3280-80503	G3270-80300
Connector, quartz	Between spray chamber and torch			G1833-65426
Connector, polypropylene	Between spray chamber and torch			G1833-65464
T-connector for optional gas introduction, quartz	Between spray chamber and torch			G1833-65427
O-rings for polypropylene connector, Viton		10/pk		G1833-65480
Clamps	Used to hold connectors	2/pk		G1833-65430
Tygon tubing, 3 m	For drain to drain tank		G3280-60077	G3280-60077



Spray chamber, quartz, G3280-80008

## Torch and Components

Description	Specifications	Use	7700 Part No.	7500 Part No.
Torch, quartz	2.5 mm ID	Standard for 7700 Series and 7500 Series Not suitable for samples containing hydrofluoric acid. Must be completely dried before installing and igniting the plasma. Replace if chipped, cracked, or distorted.	G3280-80001	G3270-67002
Torch, quartz	1.5 mm ID, taper type	Not suitable for samples containing hydrofluoric acid. Must be completely dried before installing and igniting the plasma. Replace if chipped, cracked, or distorted.	G3280-80004	G1833-65424
Torch, quartz	1.0 mm ID, taper type	Not suitable for samples containing hydrofluoric acid. Must be completely dried before installing and igniting the plasma. Replace if chipped, cracked, or distorted.	G3280-80005	G1833-65425
Shield plate, long life		Use with the bonnet.	G1833-65419	G1833-65419
Bonnet (quartz ring for shield torch)		Use with shield plate (P/N G1833-65406 or P/N G1833-65419) for Shield Torch system. Replace if bonnet is cracked or damaged.	G1833-65421	G1833-65421
RF coil			G3280-60022	G1833-65432
Alignment plate for RF coil			G1833-66011	G1833-66011
Connector rod, dilution			G3270-80024	G3270-80024
Connector rod, straight			G3270-80025	G3270-80025
Clamps, 2/pk		Used to hold connectors	G1833-65430	G1833-65430

See PFA Inert Sample Introduction Kit Supplies table for the torch for inert kit



Torch, quartz, G3280-80001



Bonnet for Shield Torch, G1833-65421

## Interface Cone Guide for Agilent 7700 Series

Description	Part No.	7700x/e	7700s
<b>Sampling cone</b>			
Nickel sampling cone	G3280-67040	Std	◆
Platinum sampling cone	G3280-67036	◆	Std
Nickel plated sampling cone	G3280-67061	◆	◆
Platinum sampling cone, 18 mm insert	G3280-67056	◆	◆
<b>Skimmer cone</b>			
Nickel skimmer cone	G3280-67041	Std	
Platinum skimmer cone	G3280-67060	◆	
Platinum skimmer cone, nickel base	G3280-67063	◆	
Platinum skimmer cone, copper base	G3280-67064		Std
Nickel skimmer cone	G3280-67066		◆
Platinum skimmer cone, nickel base	G3280-67065		◆
Copper skimmer cone	G3280-67067		◆
<b>Skimmer base</b>			
Skimmer base, stainless steel	G3280-60608	Std	
Skimmer base, brass	G3280-60621	◆	
Skimmer base, brass	G1833-65590		Std
Skimmer base, stainless steel	G1833-65591		◆
Skimmer base (offset), brass, for special application	G3280-60381		◆

**Key**

- ◆ : Compatible Part
- Std: Fitted as standard when instrument shipped from factory

**Notes:**

- 18 mm Pt cone insert is recommended for measuring  $\text{H}_2\text{SO}_4$  above 2%
- Pt T-mode cones are not available
- T-mode is not used with ORS models



## Interface Cones and Ion Lenses

Interface Cone Guide for Agilent 7500 Series								
Description	Part No.	7500a	7500i	7500s	7500c	7500ce/cx	7500cs	T-mode
<b>Sampling cone</b>								
Nickel sampling cone	G1820-65238	Std	Std	◆	Std	Std	◆	
Platinum sampling cone, 10 mm insert	G1820-65239	◆	◆	Std	◆	◆	Std	
Platinum sampling cone, 18 mm insert	G1820-65360	◆	◆	◆	◆	◆	◆	
Nickel sampling cone for T-mode	G1820-65480	T-mode	T-mode	T-mode				◆
<b>Skimmer cone</b>								
Nickel skimmer cone	G1820-65050	Std	Std	◆				
Nickel skimmer cone	G3270-65024					Std		
Nickel skimmer cone	G1833-65497				Std		◆	
Platinum skimmer cone	G1820-65237	◆	◆	Std				
Platinum skimmer cone	G1833-65092				◆			
Platinum skimmer cone	G1833-65132					◆	Std	
Platinum skimmer cone (Ni base)	G3270-60106						◆	
Copper skimmer cone	G3270-60643						◆	
Nickel skimmer cone for T-mode	G1820-65481	T-mode	T-mode	T-mode				◆
<b>Skimmer base</b>								
Stainless steel base for nickel skimmer	G1833-65407	Std	Std	◆				◆
Stainless steel base for nickel skimmer	G1833-65591					Std	◆	
Stainless steel base for nickel skimmer	G1833-65498				Std			
Brass base for platinum skimmer	G1833-65408	◆	◆	Std				
Brass base for platinum skimmer	G1833-65505				◆			
Brass base for platinum skimmer	G1833-65590					◆	Std	



Sampling cone, nickel, G3280-67040



Skimmer cone, nickel, G3280-67041

**Sampling and Skimmer Cone Supplies**

<b>Description</b>	<b>7700 Part No.</b>	<b>7500 Part No.</b>
Interface wrench for sampling cone	G3280-01507	G1833-65405
Retaining ring for sampling cone	G3280-20504	
Graphite gasket for sampling cone, 3/pk	G3280-67009	
Interface wrench for skimmer cone removal	G3280-60502	G1833-65079
Screws for skimmer base, 4/pk	G1820-65435	G1820-65435
Cone cleaning detergent, 1 gallon	5188-5359	5188-5359
Alumina powder, abrasive, 1 kg	8660-0791	8660-0791
Cotton swab, ultra-fine cone bud shape, both ends, 100/pk	9300-2574	9300-2574
O-ring for sampling cone, Viton		G1820-65025

**Ion Lens System Components for 7700 Series**

<b>Description</b>	<b>Part No.</b>
<b>7700x/e</b>	
Extraction-offset lens assembly	G3280-67039
Extraction lens 1	G3280-60612
Extraction lens 2	G3280-60613
Omega bias lens	G3280-01650
Omega lens	G3280-60609
Screw and spacer kit for x-lens	G3280-67037
<b>7700s</b>	
Extraction-omega lens assembly	G3280-67035
Extraction lens 1	G1833-65592
Extraction lens 2	G1833-65593
Omega bias lens	G3280-20646
Omega lens	G3280-20653
Screw and spacer kit for s-lens	G3280-67038
<b>7700x/s/e</b>	
Reaction cell assembly	G3280-60650
Octopole	G3280-67045
Cell focus lens	G3280-20633
Cell entrance lens	G3280-20618
Cell exit lens	G3280-20664
Screw/spacer/O-ring for cell	G3280-67044
Tubing for cell gas	G3280-20663
Deflect lens	G3280-20628
Plate bias	G3280-60615
Polishing paper kit	G1833-65404
Waterproof sheets, #400 and #1200, 5 of each	
Manual vent valve	G3280-67046



Reaction cell assembly, G3280-60650



Extraction lens 1, G1833-65417



Extraction lens 2, G1833-65413

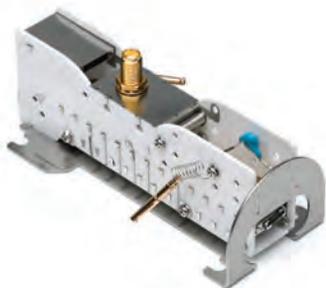
## Ion Lens System Components for 7500 Series

Description	Part No.
<b>7500a/i/s/c/cs</b>	
Plate bias (for Eagle Q-pole)	G1833-65494
Plate bias (for Slim ring Q-pole)	G1833-65444
Polishing paper kit	G1833-65404
Waterproof sheets, #400 and #1200, 5 of each	
<b>7500a/i/s</b>	
Extraction lens 1	G1833-65417
Extraction lens 2	G1833-65413
Omega lens assembly	G1833-65418
Screw kit for Extraction lens	G1833-65024
Screw kit for Omega lens	G1833-65025
<b>7500c</b>	
Einzel lens 1	G1833-65500
Einzel lens 2	G1833-65501
Einzel lens 3	G1833-65502
Extraction lens	G1833-65499
Octopole	G1833-65094
Octopole assembly (includes cell entrance/exit without O-ring)	G1833-65503
Screw and spacer kit for extraction Einzel lens	G1833-65578
Screw kit for reaction cell	G1833-65088
Tubing for reaction gas, 2/pk	G1833-65089
<b>7500ce/cx</b>	
O-ring for reaction cell	G1833-66035
Extraction-Omega lens assembly	G3270-65023
Extraction lens 1	G3270-65028
Extraction lens 2	G3270-65029
Omega lens	G3270-65030
Omega bias lens	G3270-65031
Screw and spacer kit for Extraction and Omega lens	G3270-60639

(Continued)

**Ion Lens System Components for 7500 Series**

<b>Description</b>	<b>Part No.</b>
<b>7500cs</b>	
Extraction lens 1	G1833-65592
Extraction lens 2	G1833-65593
Extraction-Omega lenses assembly	G1833-65596
Omega bias lens	G1833-65594
Omega lens	G1833-65595
Screw and spacer kit for ion lens	G1833-65125
Cell entrance lens	G1833-65598
Cell exit lens	G1833-66000
Cell focus lens	G1833-65597
<b>7500cs/ce/cx</b>	
Focus lens for Q-pole	G1833-65599
Octopole	G1833-65133
Octopole assembly (includes cell focus, cell entrance/exit, and QP focus)	G1833-65134
Reaction cell assembly	G1833-66001
Screw and spacer kit for reaction cell	G1833-65138
Plate bias for S/N JP14100050 – JP14100313	G1833-65513
Plate bias for S/N JP14100314 or later	G1833-65562
Reaction cell assembly, stainless steel	G3270-65060



Electron multiplier, 5190-0108

**Electron Multipliers**

<b>Description</b>	<b>7700 Part No.</b>	<b>7500 Part No.</b>
Electron multiplier (ETP)		5184-1983
Electron multiplier (HPK)		G1833-65575
Electron multiplier	5190-0108	

## Vacuum System Supplies

- When plasma is ON, check pump oil level every three months
- Maintain oil level between Max and Min levels on the gauge
- Standard frequency for changing the oil is approximately every six months

**Warning: Be careful when changing oil because it may have absorbed dangerous substances. The oil in the foreline pump (rotary pump) on the interface side of a 7700/7500 equipped with a hydrofluoric acid resisting introduction system is especially dangerous. DO NOT TOUCH THE OIL WITH BARE HANDS.**



Oil mist filter element for E2M18, 1535-4970



Odor element for oil mist filter, 5063-9153



Foreline pump oil, 6040-0834

### Rotary Pumps and Vacuum System Supplies

Description	Unit	7700 Part No.	7500 Part No.
Oil mist filter element for E2M18		1535-4970	1535-4970
Oil mist filter kit for E2M18		3162-1056	3162-1056
O-Ring for vacuum chamber, Viton		5042-4790	5042-0901
Odor element for oil mist filter	5/pk	5063-9153	5063-9153
Foreline pump (rotary pump) oil, 4 L	1 gal	6040-0798	6040-0798
Foreline pump (rotary pump) oil, Inland 45, 1 L	1 liter	6040-0834	6040-0834
Electrode kit for penning gauge			G1820-81013
Tube AIM gauge			G1820-81012
O-rings for vent valve, Viton	2/pk		G1833-65332

## Autosampler Supplies



Tray B, 53 position for 19 mL vials, PP,  
G3160-80061

### Integrated Autosampler(I-AS) Supplies

Description	Unit	Common Part No.
Tray A, 89 position for 6 mL vials, PP		G3160-80060
Tray B, 53 position for 19 mL vials, PP		G3160-80061
Tray C, 18 position for 50 mL vials, PP		G3160-80062
Tray D, 79 x 2 mL + 10 x 18 mL positions, PP		G3160-80063
Tray E, 79 x 6 mL + 10 x 18 mL positions, PP		G3160-80064
Tray F, 15 position for use in special semiconductor applications, PP		G3160-80065
PFA vial, 1.5 mL	10/pk	G3160-65317
6 mL vials	200/pk	G3160-65303
18 mL vials	55/pk	G3160-65304
50 mL vials	20/pk	G3160-65305
Polyethylene vial, 2 mL	200/pk	G3160-65315
PFA needle, 0.3 mm ID		G3160-65306
Rinsing bottle, 100 mL	6/pk	G3160-65307
Tray cover		G3160-65321
Rinse fluid inlet/outlet tubing (for I-AS with diaphragm pump)		G3160-65320
PFA Needle, 0.8 mm ID		G3160-65324
Tubing holder, PEEK		G3160-65325
Needle holder		G3160-80041
Holder for carry tray cover		G3160-60015
Peristaltic pump tubing set with connectors	1 set	G3160-65326
Peristaltic pump tubing set with connectors	5 sets	G3160-65327
Drain tubing, Tygon, from peristaltic pump to rinse bottle or drain bottle	2 pieces	G3160-65328
Serial-USB converter cable for use with G7201A MassHunter		G3160-80200



ASX-520 Autosampler



Sample rack, 60 position, G3286-80106



Sample probe, G3286-80102

## ASX-500 Series Autosampler Supplies

Description	Common Part No.
Sample rack, 21 position, 50 mL vials	G3286-80103
Sample rack, 24 position, 30 mL vials	G3286-80104
Sample rack, 40 position, 20 mL vials	G3286-80105
Sample rack, 60 position, 14 mL vials	G3286-80106
Sample rack, 90 position, 8 mL vials	G3286-80107
Sample probe, 0.8 mm ID (red band)	G3286-80100
Sample probe, 0.3 mm ID (black band)	G3286-80101
Sample probe, 0.5 mm ID (blue band)	G3286-80102
Carbon fiber sample probe, 0.8 mm ID (red band)	G3286-80110
Carbon fiber sample probe, 0.3 mm ID (black band)	G3286-80111
Carbon fiber sample probe, 0.5 mm ID (blue band)	G3286-80112
Rinse/drain tubing hookup kit	G3286-80117
Drain pump tubing and connector kit (Tygon)	G3286-80118
Z-axis drive assembly with nylon cable	G3286-80230
Rinse station	G3286-80224
USB 2.0 cable (10 ft.) for use with G7201A MassHunter	G1680-63720

# Peripherals Supplies

## ISIS Supplies

Description	Specifications	Unit	7700 Part No.	7500 Part No.
Comprehensive spares for ISIS			G4911-67001	G3138-65006
Preconfigured kit (auto dilution)			G4911-68201	G3138-65024
Preconfigured kit (discrete sampling)			G4911-68202	G3138-65025
Preconfigured kit (high throughput)				G3138-65023
Peristaltic pump tubing, Tygon	0.89 mm ID, 3 stops	12/pk	5064-8014	5064-8014
Peristaltic pump tubing	0.25 mm ID, 2 stops, flared end	12/pk	G4911-67000	
Peristaltic pump tubing, Tygon	0.25 mm ID, 3 stops	12/pk		5064-8034
Peristaltic pump tubing, Tygon	0.25 mm ID, 2 stops	12/pk		5064-8015
Peristaltic pump tubing, Tygon	1.02 mm ID, 2 stops	12/pk	5064-8028	5064-8028
Peristaltic pump tubing, Tygon	2.29 mm ID, 2 stops	12/pk	5043-0010	5043-0010
Peristaltic pump tubing adapter		2/pk	5064-8026	5064-8026
Peristaltic pump tubing adapter	2.29 mm ID		G4911-20021	
Sample tubing, ETFE	0.8 mm ID, 1.6 mm OD		5064-8016	5064-8016
Sample tubing, PTFE	2 mm ID, 3 mm OD		5064-8020	5064-8020
Sample tubing, PFA	0.5 mm ID, 1.6 mm OD, 5 m			G1820-65105
ISTD tubing, PFA	0.3 mm ID, 1.6 mm OD, 3 m			G1820-65478
T-joint			5064-8017	5064-8017
T-joint with earth block			G3280-67062	
Cross joint			5064-8018	5064-8018
Union joint			5064-8019	5064-8019
PTFE nut	For 3 mm OD tubing	10/pk	5064-8021	5064-8021
Front and back ferrule	For 3 mm OD tubing	10/pk	5064-8022	5064-8022
PTFE nut for cross joint	For 1.6 mm OD tubing	10/pk	5064-8023	5064-8023
Front and back ferrule	For 1.6 mm OD tubing	10/pk	5064-8024	5064-8024
Tubing adapter				G3138-65158
Tubing clamp			5064-8027	5064-8027
Spiral tubing, 5 m			5064-8029	5064-8029
Wrench for valve maintenance			5064-8032	5064-8032
Tag for tubing identification		10/pk	5064-8033	5064-8033
APG remote cable			5182-2581	5182-2581
Joint holder				G3138-65102
Joint holder for nebulizer pump			G4911-01201	
Joint holder for ISIS Pump			G3138-65103	G3138-65103
Sample line connector				G3138-65104
Rotor seal for valve			G3138-65117	G3138-65117
Nut for valve		6/pk	G3138-65118	G3138-65118
Ferrule for valve		6/pk	G3138-65119	G3138-65119
Mixer			G3138-65121	G3138-65121
Sample loop, 100 µL			G3138-65122	G3138-65122
Plastic tray				G3138-65125
Tray for ISIS			G4911-60011	

**ISIS Hydride Generation Accessory Supplies**

<b>Description</b>	<b>Specifications</b>	<b>Unit</b>	<b>Common Part No.</b>
Hydride generation kit for 7700 Series with ISIS			G4911-68210
Gas/Liquid separator set			G3138-65130
Includes separator gas chamber, filter O-ring, separator holder, exclusive concentric nebulizer, O-ring for nebulizer, cyclone chamber and filter (5/pk)			
Separator gas chamber			G3138-65131
O-ring for filter			G3138-65132
Filter		10/pk	G3138-65137
Separator holder			G3138-65133
Exclusive concentric nebulizer			G3138-65134
O-ring for nebulizer		2/pk	G3138-65135
Cyclone chamber			G3138-65136
Peristaltic pump tubing, PharMed	2.54 mm ID, 2 stops	6/pk	G3138-65128
Tubing for gas line	3 mm ID, 4 mm ID, 5 m		G3138-65138
Plug for cross joint		3/pk	G3138-65129
Reducing union connector	8 x 4 mm		G3138-65144
Reducing union connector	6 x 3 mm		G3138-65139
Reducing union connector	6 x 4 mm		G3138-65140
Plug for carrier gas connector	4 mm OD	3/pk	G3138-65141
Y connector for pump tubing	2.5 mm ID	5/pk	G3138-65143

**Consumables Kits for 7700 Series**

<b>Description</b>	<b>Part No.</b>
Basic consumables kit for 7700x ICP-MS	G3280-67003
Comprehensive spares for 7700x ICP-MS	G3280-67004
Comprehensive spares for 7700s ICP-MS	G3280-67007
Comprehensive spares for 7700e ICP-MS	G3280-67085

**GC Interface Supplies for 7500 Series**

<b>Description</b>	<b>Part No.</b>
Injector assembly	G3158-65001
Torch	G3158-65007
Stainless steel pipe (Sulfinert) for GC-ICP-MS interface, 1/16 in.	G3158-65003

**GC Interface Supplies for 7700 Series**

<b>Description</b>	<b>Part No.</b>
Transfer line for 7700 GC interface	G3158-80060
Injector assembly for 7700 GC interface	G3158-80050
Torch for 7700 GC interface	G3158-80071
Pre-heating pipe with connector, stainless steel, 1/16 in.	G3158-80080
Stainless steel pipe, 1/16 in. (Sulfinert, 1.05 m)	G3158-80081
Vespel/Graphite reducing ferrule (1/8 in. to 1/16 in., VG1, 10/pk)	0100-1344
Vespel/Graphite ferrule (1/4 in., VG1, 10/pk)	0100-1331
Vespel/Graphite ferrule for 320 µm columns (0.5 mm, VG1, 10/pk)	5062-3506
Vespel/Graphite ferrule (1/16 in., VG2, 10/pk)	0100-1379
PFA tubing, 1/8 in., 2 m	G3158-60010
3-way manual valve	G3158-80024
Swagelok plug, stainless steel, 1/8 in.	0100-0071
Nut with pipe	G3158-80009
Stainless steel tee for O <sub>2</sub> gas mix, 1/8 in.	0100-0542

**As Speciation Columns**

<b>Description</b>	<b>Part No.</b>
As speciation column for drinking water	G3154-65001
As speciation column for urine	G3288-80000
As speciation guard column	G3154-65002
LC connection kit	G1833-65200

**Miscellaneous Supplies**

<b>Description</b>	<b>Part No.</b>
7700 maintenance video DVD	G3280-60910
Cooling water hose, 10 m	G1833-65429
Strainer for cooling water	G1833-66024
Poly-clear fluid for G3292A chiller	G3292-80010
Fluid filter for G3292A chiller	G3292-80109
Air filter for G3292A chiller	G3292-80112
Filter for cooling water for 7500 Series	G1820-65018
Water filter connector for 7500 Series	G1820-80430
O-ring for water filter cartridge for 7500 Series	G1833-66042
O-ring for reaction cell for 7500 Series 2/pk	G3270-65036
Organic solvent introduction kit for 7700 Series	G3280-60580

## ■ ATOMIC SPECTROSCOPY STANDARDS

- Give you confidence in your AAS, ICP-OES or ICP-MS results
- Standards shipped from stock to maximize uptime
- Supplied with a Material Safety Data Sheet (MSDS) and Certificate of Analysis for complete assurance

### AA and ICP-OES Standards

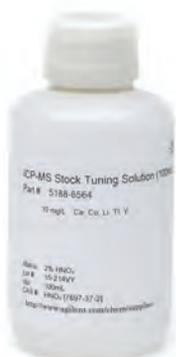
#### ICP-OES Wavelength Calibration Solutions for 700-ES and Vista Series

Description	Part No.
ICP-OES wavelength calibration solution: 500 mL, contains 50 mg/L Al, As, Ba, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sr, Zn and 500 mg/L K in 5 % HNO <sub>3</sub> + tr HF Dilute 10 times prior to use	6610030000
ICP-OES wavelength calibration solution: 500 mL, contains 5 mg/L Al, As, Ba, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sr, Zn and 50 mg/L K in 5 % HNO <sub>3</sub> + tr HF Ready to use	6610030100
ICP internal standard: 125 mL, contains 100 mg/L <sup>6</sup> Li, Sc, Y, In, Tb and Bi in 5 % HNO <sub>3</sub>	6610030400

#### Multi-Element Calibration Standards

Description	Part No.
Calibration mix 1: 125 mL, contains 100 mg/L Sb, Mo, Sn and Tl in 2 % HNO <sub>3</sub> + 0.5 % HF	6610030500
Calibration mix 2: 125 mL, contains 100 mg/L Ag, Al, As, Ba, Be, Cd, Co, Cr, Cu, Mn, Ni, Pb, Se, Tl, Th, U, V and Zn in 5 % HNO <sub>3</sub>	6610030600
Calibration mix majors: 125 mL, contains 500 mg/L Ca, Fe, K, Mg and Na in 5 % HNO <sub>3</sub>	6610030700
Calibration mix 3, organic: 100 mL, contains 500 ppm Ag, Al, B, Ba, Ca, Cd, Cr, Cu, Fe, Mg, Mn, Na, Ni, P, Pb, Si, Sn, Ti, V and Zn in mineral oil	6610030200

## ICP-MS Standards



Stock Tuning Solution, 5188-6564

## Installation and Checkout Standards

Description	Part No.
ICP-MS Checkout Solutions for 7500ce/cx/cs system installation kit Contains tuning solution, dual mode (1), dual mode (2), wash, and water blank solutions	5185-5850
ICP-MS Checkout Solutions for 7500s system installation kit Contains tuning solution, dual mode (1), dual mode (2), abundance sensitivity (1), abundance sensitivity (2), detection limit solution, high sensitivity tune, wash, and water blank solutions	5184-3564
ICP-MS Checkout Solutions for 7500a/i/c system installation kit Contains tuning solution, dual mode (1), dual mode (2), wash, and water blank solutions	5184-3565

## Tuning Solutions

Description	Part No.
PA Tuning Solution Kit: Tuning 1: 20 ppm each of Zn, Be, Cd, As; 10 ppm each of Ni, Pb, Mg; 5 ppm each of Tl, Na, Al, U, Cu, Th, Ba, Co, Sr, V, Cr, Mn, <sup>6</sup> Li, Sc, In, Lu, Bi; 2.5 ppm each of Y, Yb; matrix 2-5% HNO <sub>3</sub> Tuning 2: 10 ppm each of Mo, Sb, Sn, Ge, Ru, Pd; 5 ppm of Ti, Ir; matrix 10% HCl and 1% HNO <sub>3</sub> with trace amounts of HF	5188-6524
Stock Tuning Solution: Li, Y, Ce, Tl and Co; 100 mL, 10 mg/L; matrix 2% HNO <sub>3</sub>	5188-6564
Stock Tuning Solution: Li, Mg, Y, Ce, Tl and Co; 100 mL, 10 mg/L; matrix 2% HNO <sub>3</sub>	5190-0465
Tuning Solution: Li, Y, Ce, Tl and Co; 2 x 500 mL, 10 µg/L; matrix 2% HNO <sub>3</sub>	5184-3566
Tuning Solution: Li, Mg, Y, Ce, Tl, Co; 2 x 500 mL, 1 µg/L; matrix 2% HNO <sub>3</sub>	5185-5959

**Multi-Element Calibration Standards**

<b>Description</b>	<b>Part No.</b>
Multi-Element Calibration Standard-1, 100 mL: 10 mg/L of Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sc, Sm, Tb, Th, Tm, Y, Yb; matrix 5% HNO <sub>3</sub>	8500-6944
Multi-Element Calibration Standard-2A, 100 mL: 10 mg/L of Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, K, Li, Mg, Mn, Na, Ni, Pb, Rb, Se, Sr, Tl, U, V, Zn; matrix 5% HNO <sub>3</sub>	8500-6940
Multi-Element Calibration Standard-3, 100 mL: 10 mg/L of Sb, Au, Hf, Ir, Pd, Pt, Rh, Ru, Te, Sn; matrix 10% HCl/1% HNO <sub>3</sub>	8500-6948
Multi-Element Calibration Standard-4, 100 mL: 10 mg/L of B, Ge, Mo, Nb, P, Re, S, Si, Ta, Ti, W, Zr; matrix H <sub>2</sub> O/trace HF	8500-6942

**Single Element Standards**

<b>Description</b>	<b>Part No.</b>
Bismuth, 100 mL, 10 mg/L	8500-6936
Cobalt, 100 mL, 10 mg/L	8500-6947
Gold, 100 mL, 10 mg/L	8500-7000
Indium, 100 mL, 10 mg/L	8500-6946
Mercury, 100 mL, 10 mg/L	8500-6941
Rhodium, 100 mL, 10 mg/L	8500-6945

**Interference Check Mixes**

<b>Description</b>	<b>Part No.</b>
6020 Interference Check Solution A, 100 mL: 20,000 ppm of Cl; 3,000 ppm of Ca; 2,500 ppm each of Fe, Na; 2,000 ppm of C; 1,000 ppm each of Al, Mg, P, K, S; 20 ppm each of Ti, Mo; matrix 5% HNO <sub>3</sub> with trace amounts of HF	5188-6526
6020 Interference Check Solution B, 100 mL: 20 ppm each of Cr, Co, Cu, Mn, Ni, V; 10 ppm each of As, Cd, Se, Zn; 5 ppm of Ag; matrix 5% HNO <sub>3</sub>	5188-6527

**Environmental Standards**

<b>Description</b>	<b>Part No.</b>
Environmental Calibration Standard, 100 mL: 1,000 mg/L of Fe, K, Ca, Na, Mg; 10 mg/L of Ag, Al, As, Ba, Be, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Sb, Se, Ti, V, Zn, Th, U; matrix 10% HNO <sub>3</sub>	5183-4688
Initial Calibration Verification Standard, 100 mL: 1,000 mg/L of Fe, K, Ca, Na, Mg, Sr; 10 mg/L of Ag, Al, As, Ba, Be, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Sb, Se, Ti, V, Zn, Th, U; matrix 5% HNO <sub>3</sub>	5183-4682
Internal Standard Mix, 100 mL: 100 ppm of <sup>6</sup> Li, Sc, Ge, Rh, In, Tb, Lu, Bi; matrix 10% HNO <sub>3</sub>	5188-6525
Internal Standard Mix, 100 mL: 10 mg/L of <sup>6</sup> Li, Sc, Ge, Y, In, Tb, Bi; matrix 5-10% HNO <sub>3</sub>	5183-4681
Environmental Spike Mix, 100 mL: 1,000 mg/L of Fe, K, Ca, Na, Mg; 100 mg/L of Ag, Al, As, Ba, Be, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Sb, Se, Ti, V, Zn, U; matrix 5% HNO <sub>3</sub>	5183-4687



This information is subject to change without notice.  
© Agilent Technologies, Inc. 2011