

Consumables and Accessories 2002 Catalog



e-ssentials™ – critical supplies
for your analytical **instrument**

Atomic Absorption

Inductively Coupled
Plasma – OES and MS

Liquid Chromatography

Gas Chromatography

UV Visible, Fluorescence, and Polarimetry

Thermal and Elemental Analysis

Infrared Spectroscopy


PerkinElmer™
instruments.

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Canada L4L 8H1

RETURN GOODS POLICY

Before returning any item to PerkinElmer, please obtain a Return Authorization Number from a customer service representative. Call toll free 1-800-762-4000 in the U.S. or 1-800-561-4646 in Canada. Please have the following information ready:

1. Our Order Number or your Purchase Order Number.
2. The PerkinElmer part numbers of the items that you wish to return.
3. Reason for return.

Our customer service representative will provide you with an RMA number and the return address. We cannot accept any returns without an RMA number.

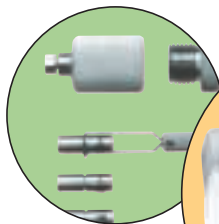
TECHNICAL SUPPORT

Call toll free 1-800-762-4000 in the U.S. or 1-800-561-4646 in Canada. 8:30 a.m. to 5:00 p.m. EST.

OUTSIDE THE U.S. & CANADA

Contact your local sales office. A full list of Worldwide Support numbers follows the Table of Contents.

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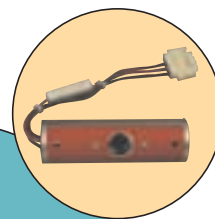
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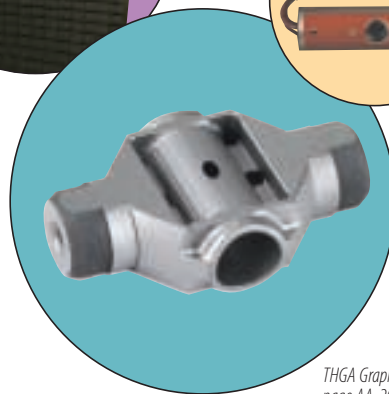
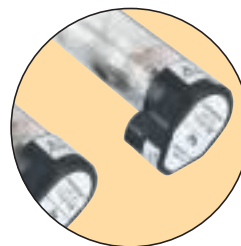


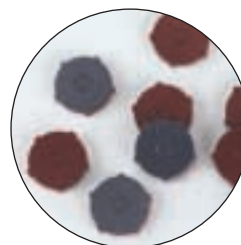
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1.800.561.4646 Canada

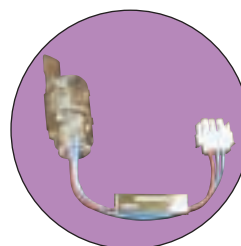
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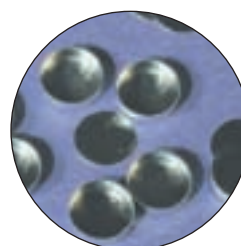
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Worldwide Support

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55-11-3145-3620
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502-4354110
502-4336030
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Fax: 504-220-5426

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Fax: 91 22 533 5940

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Fax: 62-21-5348316

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Fax: 81-45-3145142

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Fax: 81-6-63867009

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Fax: 52 55 55 93 62 23
52 55 56 60 77 34

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United States

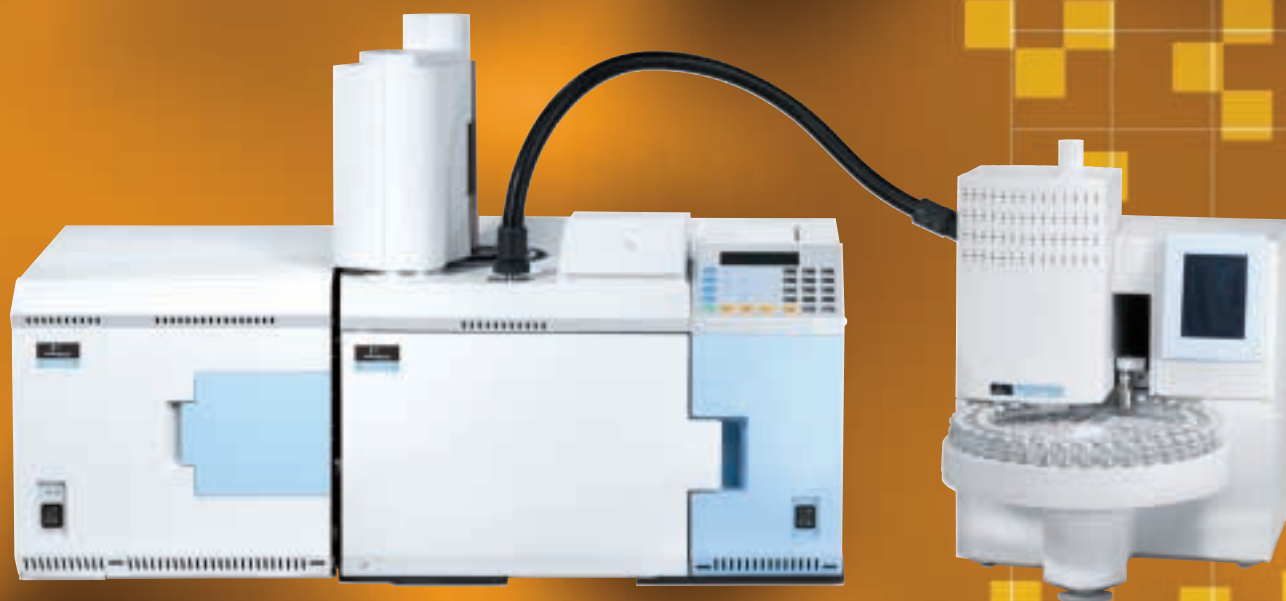
Tel: 800-762-4000
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e-ssential supplies for . . .

Gas Chromatography

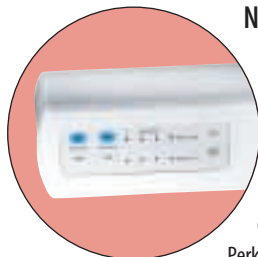
PerkinElmer is the only company offering a complete suite of chromatography tools – from GC and GC-MS systems to productivity-enhancing accessories like autosamplers, headspace samplers, and thermal desorption systems. Our TotalChrom™ data systems offer 21 CFR Part 11 Compliance. The TurboMass™ Gold Mass Spectrometer is the fastest, widest, mass-range quadrupole mass spectrometer available for GC/MS. Whatever your application – Pharmaceutical, Environmental, Chemical, Flavor, and Fragrance – PerkinElmer delivers the accuracy and precision you need.



TurboMass Gold with TurboMatrix 110

Top-selling e-ssentials for . . .

Gas Chromatography



NCI 901/902 Interface

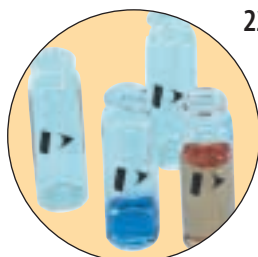
All TotalChrom™ systems utilize PerkinElmer Intelligent Interfaces to connect each chromatography system to the data system PC. Analog chromatographs utilize NCI (Network Chromatography Interface) Series Intelligent Interfaces. The NCI 901 is a single-channel device, while the NCI 902 is a dual-channel device. See page GC-46 for a full selection of

PerkinElmer Intelligent Interfaces.

NCI 902 Part No. S9000090

NCI 901 Part No. S9000070

GC-46



22 mL Sample Vials for Headspace Samplers

Guaranteed to meet the stringent requirements of high-pressure use in the TurboMatrix™ Headspace sampler. Package of 1000 22 mL vials (does not include septa or caps). See GC-3 for a full selection of Headspace Vials and Caps.

Part No. B0104236

GC-3



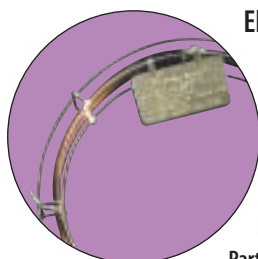
Headspace Septa

PerkinElmer's patented design incorporates pressure relief features which guarantee safe operation with the high pressure typically developed during thermostating. Package of 100, includes caps and starsprings (19 mm diameter). See page GC-3 for a full selection of Headspace Septa.

PTFE/Silicone Part No. B0104241

PTFE/Butyl Rubber Part No. B0104239

GC-3



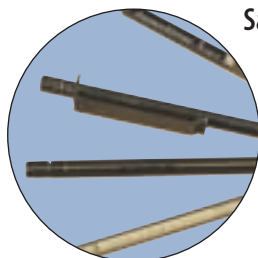
Elite Capillary Columns

PerkinElmer offers one of the widest selections of capillary columns available, including the Elite 5ms, designed to meet strict EPA Drinking Water and Wastewater Test Methods. See pages GC-49 through GC-80 for our full selection of Elite Capillary Columns.

Elite-5ms 30 m x .25 mm i.d., 25 µm

Part No. N9316282

GC-49
to GC-80



Sample Tubes for TurboMatrix

Package of 10 Stainless Steel Carbopack™ B 60/80 Sample Tubes for TurboMatrix Thermal Desorbers. Commonly used for sampling compounds in air. See page GC-10 for our complete selection of Packed Sample Tubes for TurboMatrix.

Part No. N9307009

GC-10

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PerkinElmer: The Leader in GC Innovation

1.800.561.4646 Canada

Gas chromatography started in 1952, with the seminal work of A.J.P. Martin and A.T. James and, within a few years, it became one of the most popular analytical techniques. PerkinElmer had a crucial role in the development of the technique:

- *The Model 154 introduced in 1955 was the most popular gas chromatograph for years.*
- *PerkinElmer was the first who, in 1956, introduced the first rotary-type gas sampling valve; all of the present gas sampling and switching valves are descendants of the original PerkinElmer design.*
- *In 1958 PerkinElmer's M.J.E. Goley invented the capillary columns which, with their superior efficiency further extended the usefulness of the technique to the analysis of complex, natural samples and slowly replaced the original packed columns in almost every application.*
- *In 1959, PerkinElmer was the first instrument company to introduce a gas chromatograph incorporating such columns with a flame-ionization detector.*
- *Another major PerkinElmer contribution was the development of headspace sampling. The first gas chromatograph with such a system was first introduced in 1967, opening entirely new possibilities in analytical chemistry.*
- *In the 46 years since the introduction of the first PerkinElmer gas chromatograph we continuously improve our systems, and develop new instruments and accessories, which assure their optimal utilization for the widest variety of samples an analyst may encounter. This catalog reflects the present state-of-the-art of GC instrumentation.*



TurboMatrix™ Headspace Samplers

1.800.762.4000 US

GC-2

PerkinElmer TurboMatrix Headspace Samplers eliminate tedious and error-producing steps required in other GC sample preparation techniques, enabling you to analyze volatile compounds in less time. The intuitive touch-screen graphical user interface provides easy control of the sampler.

The system is fully self-contained and can be interfaced to almost any gas chromatograph, giving you access to PerkinElmer's proven headspace technology, regardless of the brand or model GC you have in your laboratory.

The TurboMatrix system maximizes sample throughput. The system can simultaneously thermostat up to 12 samples, ensuring that the next sample is always ready for analysis upon completion of the previous run. This adds up to a significant time saving since there is no need to wait for the next sample to heat.

Volatile compounds in almost any sample matrix can be analyzed simply and quickly by headspace gas chromatography. Only PerkinElmer headspace samplers utilize a pneumatic-pressure-balanced system, a proven technology that's been used in all PerkinElmer headspace samplers for more than 35 years. This unique, patented technique provides higher sensitivity and better performance than alternative techniques.

The pressure-balanced sampling technique:

- Produces sharper peaks by rapidly transferring a narrow sample band to the GC column.
- Increases sensitivity since there is no carrier gas dilution of sample.
- Avoids fractionation due to pressure changes in the syringe.
- Eliminates multiport valves that are prone to adsorption and may introduce dead volumes.
- Provides exceptional reproducibility equal to that obtainable with liquid.

The TurboMatrix system is available in your choice of entry-level, mid-range, or high-capacity systems. And, since upgradeability is built in, you can adapt your system to changing requirements by upgrading from one model to the next or adding accessories that provide more capabilities.

TurboMatrix 16

This entry-level headspace sampler holds up to 16 sample vials. The instrument performs overlapping thermostating of one vial – after the first sample is injected, the unit heats and equilibrates the next sample so it can be injected when the gas chromatograph is ready for the next run.



TurboMatrix 16

TurboMatrix 40

For those laboratories that need to analyze more than 16 samples, the mid-range model holds up to 40 sample vials. The system thermostats up to 12 vials simultaneously for automated headspace analysis. A sophisticated nesting algorithm optimizes the “virtual” oven size for maximum throughput.



TurboMatrix 40

TurboMatrix 110

The high-capacity headspace sampler is ideal for labs requiring maximum productivity and throughput. With 110 vial positions, this system can easily meet the challenges of the most demanding laboratories. The instrument calculates the optimum thermostating time for up to 12 vials, achieving the highest throughput possible. And, because the instrument can process such a large number of samples in a short period, it can output vial position numbers via BCD output for unattended operation.



TurboMatrix 110

TurboMatrix™ Headspace Supplies

1.800.561.4646 Canada

Headspace Vials and Caps

GC-3

www.perkinelmer.com/essentials



Vials and Caps

Headspace Starter Kit

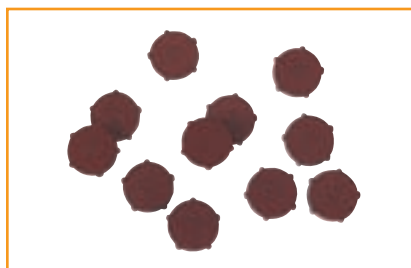
Consisting of 1000 vials (B0104236), two sets of septa, each with aluminum caps and starsprings: 200 PTFE-coated butyl rubber septa (B0104239), 200 PTFE-coated silicon rubber septa (B0104241). Also included are: hand crimper (N9302785), pressure gauge with needle for vials (B0501377), two needle seal assemblies (B0500833), 10 O-Rings (B0198110), and a book by B. Kolb and L.S. Ettre, *Static Headspace Gas Chromatography Theory and Practice* (N1011210).

Part No. B0505601

Safety Sample Vials for Headspace Samplers

22 mL vials without septa and caps.

Part No. B0104236 (pkg. 1000)



B0159356 – Butyl Rubber

Butyl Rubber Headspace Septa

Includes caps and starsprings (19 mm diameter).

Part No. B0159356 (pkg. 100)

Part No. B0159357 (pkg. 1000)



B0104239 – PTFE Butyl Rubber

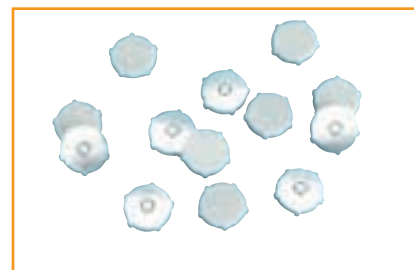
PTFE-coated Butyl Rubber Headspace Septa

Includes caps and starsprings (19 mm diameter).

Part No. B0104239 (pkg. 100)

Part No. B0104240 (pkg. 1000)

Part No. B4000025 (pkg. 1000, preassembled)



B0104243 – Aluminum Silicone

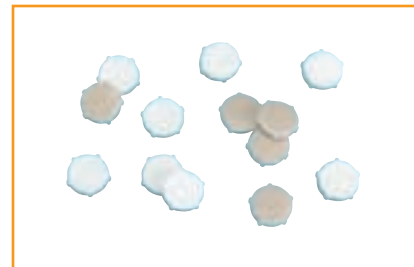
Aluminum-coated Silicone Rubber Headspace Septa

Includes caps and starsprings (19 mm diameter).

Part No. B0104243 (pkg. 100)

Part No. B0104244 (pkg. 1000)

Part No. B4000028 (pkg. 1000, preassembled)



B0104241 – PTFE Silicone

PTFE-coated Silicone Rubber Headspace Septa

Includes caps and starsprings (19 mm diameter).

Part No. B0104241 (pkg. 100)

Part No. B0104242 (pkg. 1000)

Part No. B4000022 (pkg. 1000, preassembled)



Preassembled HS Septa and Caps



Control Software

TurboMatrix HS PC Control Software

Provides full external control of a TurboMatrix headspace sampler from a personal computer running under Windows® or NT 4.0 only. Methods and sequences can be generated, stored, edited, printed, and executed. Functions include setup, diagnostics, user-defined access levels, run reports, and transfer of vial identification to TotalChrom allowing complete data traceability. On-screen interactive help function is available. Cable included (M0417035).

Part No. M0413348

Sample Trays

TurboMatrix 40 Mid-range Sample Tray

Forty (40) position sample tray for use on the mid-range headspace sampler.

Part No. M0413592

TurboMatrix 110 High-capacity Sample Tray

One hundred and ten (110) position sample tray for use on the high-capacity headspace sampler.

Part No. M0413593

Accessories

TurboMatrix HS Long Heated Transfer Line (1650 mm)

For operation up to 210°C.

Part No. M0413552

Headspace Vial Gauge

Used to check 20 mL headspace vials for correct dimensions.

Part No. B0151737

Zero Dilution Outer Liner

To be used with zero dilution inner liner. The powerful AutoSystem™ XL GC zero dilution liner allows you to achieve lower detection limits, sharpen peak shape, and increase throughput for many routine analyses. Installed in an AutoSystem XL GC standard capillary injector, this optional special hourglass insert connects the fused-silica transfer line from the headspace sampler to the capillary column, permitting undiluted and efficient sample transfer. The insert provides the advantages of a direct connection while maintaining the convenience of using a split injector as an interface.

Part No. N1011445

Zero Dilution Inner Liner

To be used with zero dilution outer liner. The powerful AutoSystem XL GC zero dilution liner allows you to achieve lower detection limits, sharpen peak shape, and increase throughput for many routine analyses. Installed in an AutoSystem XL GC standard capillary injector, this optional special hourglass insert connects the fused-silica transfer line from the headspace sampler to the capillary column, permitting undiluted and efficient sample transfer. The insert provides the advantages of a direct connection while maintaining the capability to perform split injections.

Part No. N1011446

Manual

TurboMatrix Headspace Sampler User's Manual

Part No. M0413401

TurboMatrix/HS 40XL Adapter Kits for Non-PerkinElmer Gas Chromatographs

Headspace Adapter Kit for Agilent 6890, Agilent 6850, or Agilent 5890 GC

For connection to a split/splitless or packed column injector of an Agilent 6890, Agilent 6850, Agilent 5890, or Agilent 5890 Series 2 gas chromatograph.

Part No. B0505977

Headspace Adapter Kit for Agilent 6890, Agilent 6850, or Agilent 5890 On-column

For connection to an on-column injector of an Agilent 6890, Agilent 6850, Agilent 5890, or Agilent 5890 Series 2 gas chromatograph.

Part No. B0507944

Headspace Adapter Kit for Varian Packed Column Injector

For connection to a Varian 3400 or 3800 gas chromatograph packed column injector.

Part No. B0505978

Headspace Adapter Kit for Varian Capillary Column Injector

For connection to a Varian 3400 or 3800 gas chromatograph capillary column injector.

Part No. B0508598

Headspace Adapter Kit for Varian/Finnigan ITS40

For connection to a Varian/Finnigan ITS40 GC/MS System.

Part No. B0507942

Headspace Adapter Kit for Carlo Erba

For connection to a Carlo Erba Mega or Vega gas chromatograph.

Part No. B0506603

Headspace Adapter Kit for Fisons Series 8000 and Thermo Finnigan TRACE

For connection to a Fisons Series 8000 and Thermo Finnigan TRACE gas chromatograph.

Part No. B4000012

Headspace Adapter Kit for Shimadzu

For connection to the following Shimadzu gas chromatographs: GC 9a for capillary columns, 14A packed columns, 14B packed columns, 17A packed and capillary columns.

Part No. B0505889

Headspace Adapter Kit for Shimadzu GC 16

For connection to a Shimadzu GC 16 gas chromatograph.

Part No. B0508521

Headspace Adapter Kit for Shimadzu GC 14A/B

For connection to a Shimadzu GC 14A/14B gas chromatograph with capillary columns.

Part No. B4000033

Headspace Adapter Kit for Gerstel CIS Injector

For connection to a Gerstel Cooled Injector System Inlet.

Part No. B0506539

Note: Customer should contact gas chromatograph manufacturer for the appropriate "Remote Start/Stop Cable".

Upgrade Kits

TurboMatrix 16 to 40 Upgrade Kit

Includes parts to upgrade an entry-level headspace sampler to a mid-range headspace sampler that can perform automated analysis of up to 40 vials with overlapping thermostating of up to 12 vials. Installation by PerkinElmer Service is required but not included.

Part No. M0413545

TurboMatrix 16 to 110 Upgrade Kit

Includes parts to upgrade an entry-level headspace sampler to a high-capacity headspace sampler that can perform automated analysis of up to 110 vials with overlapping thermostating of up to 12 vials.

Note: Requires, but does not include, an options board to be installed in the headspace sampler. Installation by PerkinElmer Service is required but not included.

Part No. M0413546

TurboMatrix™ Headspace Supplies

1.800.561.4646 Canada

GC-5

www.perkinelmer.com/essentials

TurboMatrix 40 to 110 Upgrade Kit

Includes parts to upgrade a mid-range headspace sampler to a high-capacity headspace sampler that can perform automated analysis of up to 110 vials.

Note: Requires, but does not include, an options board to be installed in the headspace sampler. Installation by PerkinElmer Service is required but not included.

Part No. M0413547

TurboMatrix Headspace PPC™ Add-on Kit

Includes parts to convert a headspace sampler from manual pneumatics to electronic Programmable Pneumatic Control (PPC). Installation by PerkinElmer Service is required but not included.

Part No. M0413548

Vial Shaker Add-on Kit

Adds a Frequency Scanning Shaker to a TurboMatrix 40 or TurboMatrix 110 headspace sampler. **Note:** Requires, but does not include, an options board to be installed in the TurboMatrix 40 headspace sampler. Installation by PerkinElmer Service is required but not included.

Part No. M0413549

Cryofocusing Add-on Kit

Adds cryofocusing capability to a TurboMatrix 40 or TurboMatrix 110 headspace sampler. Includes water trap to remove the water from headspace samples taken from aqueous solutions. **Note:** Requires but does not include, LN2 Dewar (B0500924). Also requires, but does not include, an options board to be installed in the TurboMatrix 40 headspace sampler. Installation by PerkinElmer Service is required but not included.

Part No. M0413550

Replacement Water Trap for Cryofocusing Accessory

Part No. B4000057

Options Board / BCD Output Board

Required for installation of the following options on the TurboMatrix 40 headspace sampler – Vial Shaker and Cryofocusing – and when upgrading a TurboMatrix 16 or 40 headspace sampler to a TurboMatrix 110. Also provides output of BCD information regarding tube position numbers and six relays for timed control of external devices. Installation by PerkinElmer Service is required but not included.

Part No. M0413551

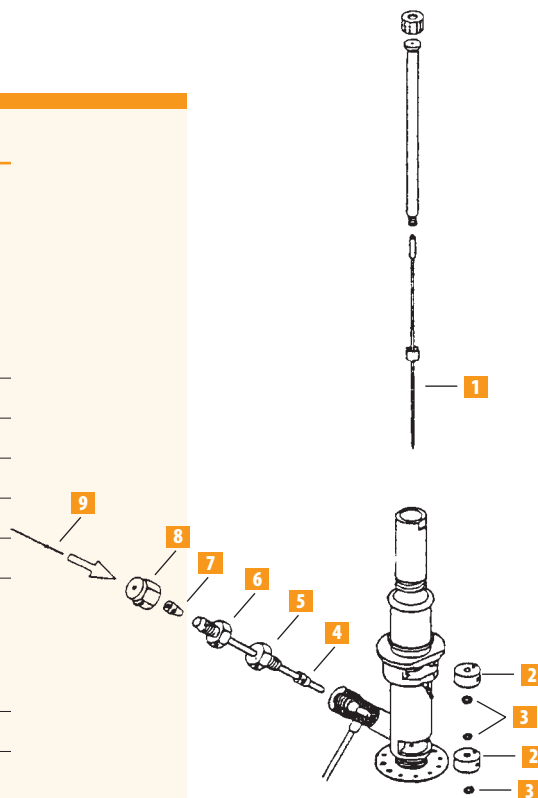
TurboMatrix Headspace/HS 40/HS 40XL Needle Identification Cross-reference Chart

The number of rings engraved into the collar or mounting bushing at the needle top in various types of needles.

Needle Type	Number of Rings for Stainless Steel	Number of Rings for Platinum Iridium
Wide-bore	none	one
Small-bore	none	two
Jet	three	four

TurboMatrix Headspace/HS 40/HS 40XL Replacement Parts

Description	Part No.
1 Platinum/Iridium needle, wide-bore	B0144169
Platinum/Iridium needle, small-bore	B0500959
Stainless steel needle, wide-bore	B0131385
Stainless steel needle, small-bore	B0500987
Stainless steel needle, jet	B4000011
Platinum/Iridium needle, jet	B0510364
2 Needle seal assembly (without O-Rings)	B0500833
3 O-Ring for needle seal assembly (pkg. 10)	B0198110
4 Vespel ferrule 1/16 in. (pkg. 10)	09920127
5 Male nut 1/16 in.	N9302832
6 GLT adapter tube	B0503956
7 Graphite/Vespel ferrule 1/16 in. x 0.4 mm (for use with 0.25 mm i.d. transfer line, pkg. 10)	09920104
Graphite/Vespel ferrule 1/16 in. x 0.5 mm (for use with 0.32 mm i.d. transfer line, pkg. 10)	09903700
8 Nut 1/16 in. Swagelok™	N9300059
9 Fused-silica Capillary Transfer Line:	
0.25 mm i.d. x 5 m length	N9301356
0.32 mm i.d. x 5 m length	N9301357



HS 40XL/HS 40 Headspace Supplies

1.800.762.4000 US

GC-6

Interfaces for HS 40XL/HS 40

Description	Part No.
RS-232 Interface. For external control. Includes cable.	B0197391
RS-232 Cable. For external control.	B0511107
BCD Interface to Turbochrom™. Provides BCD output of vial number to 2600, Turbochrom, and ACCESS*CHROM. Includes cable.	B0505520

HS 40XL Control Software

Windows®-based, flexible, easy-to-use external control software for the HS 40 and HS 40XL. The user can develop and store methods and sequences. Run reports can be obtained, stored, and printed. On-screen, context sensitive help available. Can be operated in combination with PerkinElmer TotalChrom™ Software. Requires RS-232 Interface for the HS 40XL.

Part No. B0510984

Cables

Description	Part No.
RS-232 cable (2 m) for GP-100	B0166569
HS 40XL to Agilent 6890 GC Ready Start Cable	N6100410

Miscellaneous Accessories

Cryofocusing Accessory (Brown Color)

Consists of cryofocusing module, tubing, water trap, and required unions for installation to AutoSystem™ GC. Liquid nitrogen storage tank required. Installation by PerkinElmer Service is required but not included.

Part No. B4000078

HS 40XL Cryofocusing Accessory (White Color)

Consists of cryofocusing module, firmware, required tubing unions, and water trap to be installed in AutoSystem GC. Requires liquid nitrogen storage tank. Installation by PerkinElmer Service is required but not included.

Part No. N1010047

Replacement Water Trap for Cryofocusing Accessory

Part No. B4000057

Liquid Nitrogen Storage Tank

Part No. B0500924

Cool Platen*

For storage of vials below ambient down to +5° C. Contains cool platen and tubing. Requires a thermostatted external cooling circulation water bath. Installation by PerkinElmer Service is required but not included.

Part No. B0500778

High Pressure Sampling Accessory**

Used for operation with capillary columns requiring a low head pressure. Also used for carrier gas flow control. Accessory includes high-pressure sampling module with pressure regulator, gauge, firmware, tubing, and unions. Installation by PerkinElmer Service is required but not included.

Part No. B0505271

Internal Carrier Gas Pressure Control

For carrier gas control. Includes regulator, gauge, tubing, and unions. Installation by PerkinElmer Service is required but not included.

Part No. B0505268

HS 40 Options Board

Allows up to six optional control ICs. Installation by PerkinElmer Service is required but not included.

Part No. B0184142

Recycle Mode Accessory**

Continuously repeats sequence with set-up method. Installation by PerkinElmer Service is required but not included.

Part No. B0197336

HS 40XL Shaker Accessory Add-on Kit (Red Color)

Adds Frequency Scanning Shaker to vibrate all samples in thermostating chamber. Installation by PerkinElmer Service is required but not included.

Part No. B0505475

HS 40XL Shaker Accessory Add-on Kit (Blue Color)

Adds Frequency Scanning Shaker to vibrate all samples in thermostating chamber. Installation by PerkinElmer Service is required but not included.

Part No. N1010050

HS 40XL to AutoSystem Left Side Mounting Kit (brown color)

For connecting the HS 40XL transfer line through the left side of the AutoSystem GC directly to the column in the oven instead of via the injection port. Includes a new GC side panel and parts for attaching the transfer line to the GC. Requires but does not include some type of zero dead volume connector to connect to the column (for example, a universal capillary column connector, N9302149). Installation by PerkinElmer Service is recommended.

Part No. B0505653

HS 40XL to AutoSystem Left Side Mounting Kit (White Color)

For connecting the HS 40XL transfer line through the left side of the AutoSystem XL GC directly to the column in the oven instead of via the injection port. Includes a new GC side panel and parts for attaching the transfer line to the GC. Requires but does not include some type of zero dead volume connector to connect to the column (for example, a universal capillary column connector, N9302149). Installation by PerkinElmer Service is recommended.

Part No. N1010048

Extended Transfer Line (1650 mm)

Extra-long transfer line to allow installation of HS 40XL on the right side of the AutoSystem GC or to any gas chromatograph where the HS 40XL is situated at an extended distance.

Part No. B4000046

Starter Kit

Contains: 1000 vials, 4 (pkgs. of 100) assorted septa, starsprings, caps, handcrimper, pressure gauge with needle, 2-needle seal assemblies, 10 O-Rings, and the book *Static Headspace – Gas Chromatography – Theory and Practice*, by L. Ettre and B. Kolb.

Part No. B0505601

HS 40XL Instruction Manual

Part No. 09935404

Static Headspace – Gas Chromatography – Theory and Practice, by L. Ettre and B. Kolb

Part No. N1011210

* Requires but does not include Cryostat Liquid Immersion Cooler.

** Requires but does not include Options Board.

Note: For TotalChrom™ control, see GC-44 for more information.

HS-100/101 Headspace Supplies

1.800.561.4646 Canada

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www.perkinelmer.com/essentials

Miscellaneous Tools

O-Ring Removal Tool

For replacing O-Rings in upper and lower seal assemblies.

Part No. B0147449

Thumbscrew Removal Tool

For removing lower seal assembly.

Part No. B0131410

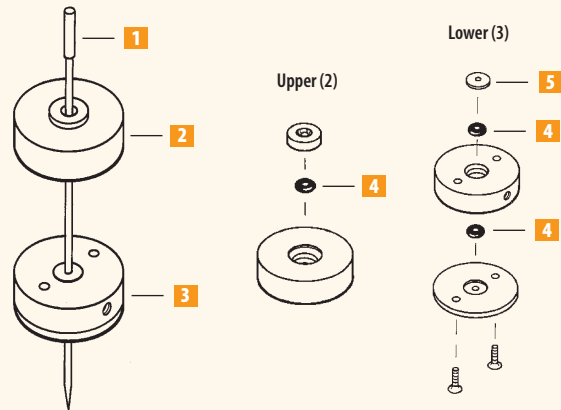
Open End Wrench Key

For removing lower seal assembly (14 mm).

Part No. B0131413

HS-100/101 Replacement Parts

Description	Part No.
1 Platinum/Iridium Needle	B0144169
Stainless Steel Needle	B0131385
2 Upper Needle Seal Assembly	B0131352
3 Lower Needle Seal Assembly	B0131355
4 O-Ring for Needle Seal Assembly (pkg. 10)	B0198110
5 Lower Needle Seal Cover	B0131382



PURGE AND TRAP SAMPLING

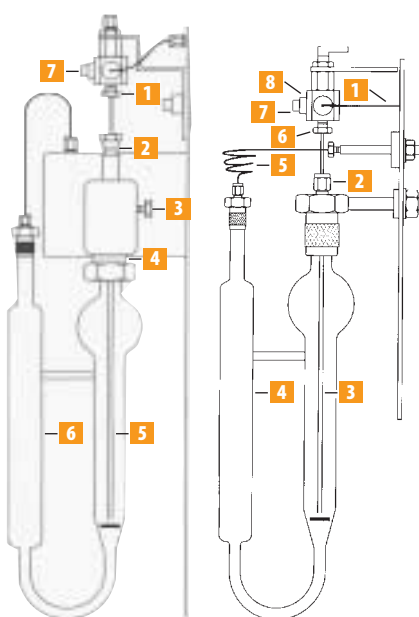
The method of choice for concentrating trace contaminants in water prior to analysis, the Purge and Trap technique is required by U.S. EPA methods such as 502.1, 502.2, 503.1, 524.1, 524.2, and 601/602 for drinking water and wastewater analysis. For more information on how to add a purge and trap concentrator, please contact your Sales Representative.

ALS 2016 Replacement Parts

Description	Part No.
Glass Sparger	(see table below)
Sample Needle Nut	N6601109
Sample Needle Ferrule	N6601110
Female Luer Connector	N6601103
3-Port Sample Valve	N6601206

Glass Spargers for LSC 2000/3000/ALS 2016

Description	Part No. Set of 16	Part No. Each
5 mL Fritted	N6601202	N6601100
25 mL Fritted	N6601203	N6601101
25 mL Fritless	N/A	N9301296



LSC 2000

LSC 3000

Interface Kit

For AutoSystem™ GC to either LSC 2000/3000. This kit is required if a direct connection from the transfer line to a packed or capillary column is desired. This kit is NOT required if the transfer line is to be connected to a packed injector.

Part No. N6120049

Replacement Parts for the LSC 2000

Description	Part No.
1 Ferrule 1/16 in.	N6601110
2 Ferrule 1/16 in. (Valco)	N6601108
3 Ferrule, Vespel 1/16 in.	N6601125
4 Ferrule, Teflon®	N6601127
5 Sample Needle 25 mL (10 1/4 in.)	N6601112
6 Glass Sparger	(see table at left)
7 Female Luer Connector	N6601103

Replacement Parts for the LSC 3000

Description	Part No.
1 Drain Line	N6603054
2 Sample Mount Assembly (1/16 in.-1/2 in.)	N6603053
3 Sample Needle 5 mL (7.75 in.)	N6603001
Sample Needle 25 mL (9.125 in.)	N6603000
4 Glass Sparger	(see table)
5 Purge Line	N6603052
6 Sample Needle Nut (1/16 in.)	N6601109
Sample Needle Ferrule	N6601110
7 Female Luer Connector	N6601103
8 3-Port Sample Valve	N6601206

LSC 2000/3000 Trap Applications

Trap No.	Trap Description	EPA Method	PE Recommended Use with EPA Method
1	Tenax™		
2	Tenax/Silica Gel/Charcoal		
3	Tenax/Charcoal		
4	OV™-1/Tenax/Silica Gel/Charcoal	502.1/502.2/ 524.1/601/8010/ 8240/8260	
5	OV-1/Tenax/Silica Gel	624/1624	
6	OV-1 Tenax	503.1/602/603/ 8020/8021/8031	603/8030
	Vocarb 3000		502.1/502.2/503.1/ 524.1/601/624/1624/ 8010/8015/8020/8021/ 8031/8260

Traps for LSC 2000

Trap Description	Part No.
Tenax Trap (#1)	N6601159
OV-1/Tenax/Silica Gel	N6601254

Traps for LSC 3000

Trap No.	Trap Description	Part No.
1	Tenax	N6603002
2	Tenax/Silica Gel/Charcoal	N6603004
3	Tenax/Charcoal	N6603045
4	OV-1/Tenax/Silica Gel/Charcoal	N6603005
5	OV-1/Tenax/Silica Gel	N6603046
6	OV-1/Tenax Vocarb 3000	N6603047 N6603049

TurboMatrix™ Thermal Desorbers

1.800.561.4646 Canada

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www.perkinelmer.com/essentials

The PerkinElmer thermal desorber simplifies and speeds a wide range of GC applications, including indoor and outdoor air monitoring, analysis of flavors and fragrances, and analysis of outgassing from packaging, polymers, pharmaceuticals, and semiconductor materials, while reducing cost per sample. The intuitive touch-screen graphical user interface provides easy control of the sampler. The system is available in manual and automatic configurations and can be upgraded to meet the challenges of tomorrow's analyses.

The TurboMatrix™ thermal desorbers allow desorption of volatile and semi-volatile components directly from sample matrices or from sorbent tubes without significant sample preparation, making sampling easier than ever. Just connect air-sampling tubes to a pump or set them out for passive adsorption. For direct desorption of volatiles, place the sample in the tube and load it into the thermal desorber where it's heated in an inert gas flow to extract and preconcentrate the components prior to injection onto the gas chromatograph.

The PerkinElmer thermal desorber instruments employ a two-stage desorption process to significantly enhance system performance. Analytes are desorbed from the sample tube and refocused onto a narrow-bore cold trap filled with one or more adsorbents. Analytes are then transferred to the GC column. This technique offers significant advantages over transferring the sample directly to the GC column, including:

- Improved chromatography and narrow peak widths as a result of 40° C per second trap heating rate.
- Higher productivity with overlapping tube desorption and chromatography.
- Wider boiling range analysis and improved water management using the backflush mode, where multiple adsorbents can be used in series.
- Uncompromised narrow-bore capillary chromatography due to rapid desorption of the focusing trap (40° C per second).

TurboMatrix Thermal Desorber



This instrument provides exceptional analytical performance in a single-sample, semiautomatic desorber. It is ideal for laboratories that use thermal desorption on a less frequent basis.

TurboMatrix Automated Thermal Desorber



This unit provides unattended analysis of up to 50 samples.

Consumables

Starter Kit

The starter kit is recommended for all purchasers who do not already have a TurboMatrix Thermal Desorber.

Part No. M0413541

Includes:

Description	Qty.	Part No.
Glass Wool	pkg. 1	54120790
Tenax™ TA 60-80 Mesh – 15 g	pkg. 1	04978064
Diffusion Cap	pkg. 50	L4070208
Packing Gauze	pkg. 100	L4071034
Retaining Spring	pkg. 50	L4071123
Stainless Steel Sample Tubes	pkg. 10	M0413595
Glass Sample Tube	pkg. 10	M0413598
PTFE Filter Discs, Large	pkg. 8	L4271159
PTFE Filter Discs	pkg. 8	L4271160
Graphite Ferrules	pkg. 2	L4271187
Trap Tube Nuts	pkg. 2	L4275009
Trap Tubes	pkg. 2	M0413627 M0410094

TurboMatrix Upper Seal Assembly

Low Temp (< 200° C), Viton® 009 O-Rings

Part No. M0415056 (pkg. 10)

Low Temp (< 200° C), Viton 011 O-Rings

Part No. M0415057 (pkg. 10)

High Temp (> 200° C), KALREZ® 011, Large Seal O-Ring

Part No. M0415361 (pkg. 1)

High Temp (> 200° C), KALREZ 009, Small Seal O-Ring

Part No. M0415360 (pkg. 1)

Fixed Upper Seal, Graphite Ferrule

Part No. 09920593

TurboMatrix New Style Mobile Seal Assembly

Mobile Seal O-Ring, Viton 009

Part No. M0415056

Mobile Seal O-Ring, Viton 010

Part No. 04970343

Nozzle Filter Disc

Part No. L4271159 (pkg. 1)

TurboMatrix Old Style Mobile Seal Assembly

Ferrules

Part No. M0413625 (pkg. 20)

Nozzle Filter Disc

Part No. L4271159 (pkg. 1)

Lower Mobile Seal for ATD 400

Viton, Large Seal O-Ring Standard

Part No. 04972383 (pkg. 10)

Viton, Small Seal O-Ring Standard

Part No. M0413626 (pkg. 10)

Gauze Loading Rig

Correctly positions gauze at both ends of stainless steel sampling tubes. Highly recommended when packing sample tubes.

Part No. L4070023

Replacement Plastic Plunger for Gauze Loading Device

Part No. L4071151 (pkg. 5)

SAMPLE TUBES FOR TURBOMATRIX

Capped Sample Tubes

Stainless Steel Part No.	Glass Lined Stainless Steel Part No.	Glass Part No.	Quantity
M0413595	M0413597	M0413598	pkg. 10
M0413596	N/A	N/A	pkg. 50

Sample Tubes Without Caps

Stainless Steel Part No.	Glass Part No.	Quantity
L4270128	L4071594	pkg. 10
L4270129	N/A	pkg. 100

Packed Sample Tubes for TurboMatrix*

Stainless Steel Part No.	Glass Part No.	Sorbent	Quantity
N9307001	N9307008	Air Toxics™ Tube	pkg. 10
N9307002	N9307009	Carbopack™ B 60/80	pkg. 10
N9307003	N9307010	Carbosieve™ SIII 60/80	pkg. 10
N9307004	N9307011	Tenax™ GR 60/80	pkg. 10
N9307005	N9307012	Tenax TA 60/80	pkg. 10
N9307006	N9307013	Chromasorb™ 106	pkg. 10
N9307000	N9307007	Carbopack B 60/80 Carbopack C 60/80 Carbosieve SIII 60/80	pkg. 10
N9307038	N9307037	NIOSH 2549 tube	pkg. 10

*Shipped with brass long-term storage caps.

Caps for TurboMatrix

Diffusion Caps – Standard

For passive air sampling to ensure correct diffusion path length.

Part No. L4070207 (pkg. 10)

Diffusion Caps with Membrane

Same as above but with a silicone membrane.

Part No. L4070208 (pkg. 10)

TurboMatrix Analytical Caps

Required for use on the TurboMatrix instrument during analysis (use with brass long-term storage caps).

Part No. N6200119 (pkg. 20)

Brass Long-Term Storage Caps

Recommended for long-term storage. Two required per tube. Also requires Teflon ferrule (04964467).

Part No. 09908851 (pkg. 1)

Combined Teflon Ferrule

For use with 1/4 in. Brass Long-term Storage Cap (09908851). Two (2) required per tube.

Part No. 04964467 (pkg. 1)

Pen Clips

For stainless steel ATD tubes.

Part No. L4071029 (pkg. 10)

PFA Teflon Ferrules for TurboMatrix Storage End Caps and for ATD Mobile Seal

Part No. M0413625 (pkg. 20)



Sample Tubes

TurboMatrix™ Thermal Desorbers

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www.perkinelmer.com/essentials

Trap Supplies

TurboMatrix Thermal Desorber Empty Trap

Part No. M0413627

TurboMatrix Air Monitoring Trap

Trap packed with carbonaceous sorbents suitable for ozone precursor and air toxics monitoring.

Part No. M0413628

TurboMatrix Thermal Desorber Packed Trap

Trap packed with Tenax™.

Part No. M0413535

Trap Heat Conduction Bushing and Ceramic Washer

Part No. M0410316

Gripper Insert Replacement

Part No. M0413645 (pkg. 2)

Trap Filter Disk

PTFE filter on either side of cold trap.

Part No. L4271160 (pkg. 1)

Trap Packing Disk

Glass fiber disk for separating sorbents when packing cold trap with multiple sorbents.

Part No. L4271290 (pkg. 20)

Trap Packing Retaining Spring

For low flow trap.

Part No. N6301054 (pkg. 5)

Graphite Ferrule

Ferrule for cold trap. Recommended for all applications except those using Mass Spec or ECD.

Part No. L4271187 (pkg. 2)

PTFE Ferrule

Ferrules for cold trap. Recommended for use with Mass Spec or ECD. **Note:** New ferrules are required when trap is changed.

Part No. L4275110 (pkg. 10)

Trap Packing Tool

Part No. L4271203

Miscellaneous Supplies

TurboMatrix ATD Sample Carousel

Fifty (50) position tube carousel for use on the TurboMatrix ATD.

Part No. M0413380

Upgrade Kits

Automated Thermal Desorber Upgrade Kit

Includes parts to upgrade an entry-level thermal desorber to an automated thermal desorber for unattended analysis of up to 50 samples. Includes BCD output communication capabilities and timed event relays for timed control of external devices. Installation by PerkinElmer Service is required but not included.

Part No. M0413553

Internal Standard Addition/ Tube Dry Purge Add-on Kit

Adds capability to introduce a known quantity of a gaseous standard into the sample tube prior to desorption to verify analyte recovery. Standard gas is added to the tube in the sampling direction allowing use of tubes packed with multiple adsorbents. **Note:** Requires, but does not include, an Options Board when added to the entry-level thermal desorber. Installation by PerkinElmer Service is required but not included.

Part No. M0413555

On-line Sampling Add-on Kit

Adds capability to perform on-line sampling of ambient air directly to the electrically cooled trap. Overlapping sampling and GC analysis allows collection of air for analysis up to 50 minutes of every hour. Includes sample valve, Nafion drier, dry air purge control, and pump. Air Toxics™ trap is installed. **Note:** Requires, but does not include, an Options Board when added to entry-level thermal desorber. Allows thermal desorber to still be used for tube desorption. Installation by PerkinElmer Service is required but not included.

Part No. M0413556

Liquid Nitrogen Cooling Add-on Kit

For operation of the cold trap to -100° C. Requires, but does not include, the options board when added to entry-level thermal desorber. Requires a pressurized Dewar with a relief valve set at 25 psig (180 kpa). Dewar must have a 1/4 in. Swagelok™ connection. Also requires a pressure relief valve set at 50 psig (350 kpa) in pipe between Dewar and TurboMatrix. Installation by PerkinElmer Service is required but not included.

Part No. M0413557

Options Board/BCD Output Board

Required for installation of the following options on an entry-level thermal desorber – Internal Standard Addition, On-line Sampling, or Liquid Nitrogen Cooling. Also provides output of BCD information regarding tube position numbers and provides relay output for timed control of external devices. **Note:** This board is included as standard on the automated thermal desorber. Installation by PerkinElmer Service is required but not included.

Part No. M0413551

Software

TurboMatrix TD/ATD PC Control Software

Provides full external control of a TurboMatrix thermal desorber from a personal computer running under Windows® 95, 98 or NT. Methods and sequences can be generated, stored, edited, printed, and executed. Functions include diagnostics, user defined access levels, run reports, and transfer of vial identification to TotalChrom allowing complete data traceability. On-screen interactive help function is available. Cable included (Part No. M0417035).

Part No. M0413559

Interface Kit

Thermal Desorber/AutoSystem (XL)

GC Interface Kit

Contains all necessary hardware for connecting the heated transfer line to either 1/8 in. packed or capillary columns inside the oven of an AutoSystem (XL) GC or other gas chromatograph.

Part No. L4270026

TurboMatrix Thermal Desorber to Agilent 6890 GC Ready Start Cable

Connects a TurboMatrix thermal desorber to an Agilent 6890 or Agilent 6850 GC.

Part No. N6100410

Manual

TurboMatrix Thermal Desorber User's Manual

Part No. M0413331

ATD 400

The ATD 400 Automated Thermal Desorber

1.800.762.4000 US

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Pen Clips

Part No. L4071029 (pkg. 10)

Brass Long-Term Storage Caps

Recommended for long-term storage. Two required per tube, also requires Teflon® ferrule (04964467).

Part No. 09908851 (pkg. 1)

Combined Teflon Ferrule

For use with 1/4 in. brass cap (09908851). Two required per tube.

Part No. 04964467 (pkg. 1)

Unsilanized Glass Wool

Part No. 00097993 (100 g)

Diffusion Caps-Standard

For passive air sampling to ensure correct diffusion path length.

Part No. L4070207 (pkg. 10)

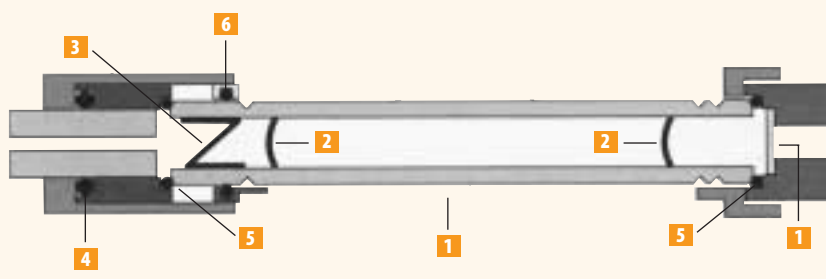
Diffusion Caps with Membrane

Same as above but with a silicone membrane.

Part No. L4070208 (pkg. 10)

Tube Replacement Parts

Description	Qty.	Part No.
1 Sample Tube(s) Packed Sample Tube(s)		See Table below See Table below
2 Packing Retaining Gauzes	100	L4071034
3 Retaining Springs	50	L4071123
4 Chamfer Holder O-Ring	1	04973727
5 Tube Seal O-Ring	10	04972383
6 Grip Seal O-Ring	50	04970343
7 Nozzle Filter Disk	1	L4271159



ATD SAMPLE TUBES AND END CAPS

ATD Prepacked Sample Tubes

Stainless Steel Part No.	Glass Part No.	Sorbent	Qty.
N9307001	N9307008	Air Toxics Tube	pkg. 10
N9307002	N9307009	Carbopack™ B 60/80	pkg. 10
N9307003	N9307010	Carbosieve™ SIII 60/80	pkg. 10
N9307004	N9307011	Tenax™ GR 60/80	pkg. 10
N9307005	N9307012	Tenax TA 60/80	pkg. 10
N9307006	N9307013	Chromosorb 106	pkg. 10
N9307000	N9307007	Carbopack B 60/80, Carbopack C 60/80 Carbosieve SIII 60/80	pkg. 10
N9307038	N9307037	NIOSH 2549 Tube	pkg. 10

Capped Sample Tubes

Stainless Steel Part No.	Glass Lined Steel Part No.	Glass Part No.	Qty.
L4270123	L4270125	L4270124	10
L4270127			50

Sample Tubes Without Caps

Stainless Steel Part No.	Glass Part No.	Qty.
L4270128	L4071594	10
L4270129		100

PTFE Sample Tube Inserts

For lining stainless steel tubes. Recommended for solid samples. Max. temp. 250° C.

Part No. L4071596 (pkg. 20)

Standard PTFE Storage End Caps

Suitable for one week storage. Required for sealing tubes while on ATD carousel.

Part No. L4270122 (pkg. 20)

Miscellaneous Accessories

ATD 400 Starter Kit

Includes: glass wool (10 g), fused-silica transfer line insert, diffusion caps (10), packing gauzes (100), retaining springs (50), PTFE insert for sample tubes (20), trap tube, nozzle filter disk (1), trap filter disk (1), graphite ferrule (1 pkg.), cold trap nut (2), PTFE tube 0.035 in., O-Ring grip seal, O-Ring nozzle seal, O-Ring guide seal, vespel ferrule.

Part No. L4270028

Regulator 0-60 psig

The standard 0-30 psig regulator can be replaced with this 0-60 psig regulator to expand the choice of column and application range. Installation by a PerkinElmer Service Engineer is required but not included.

Part No. N6101474

Graphite Vespel Ferrule

1/16 in. x 0.5 mm i.d. For connection of 0.32 mm i.d. transfer line to ATD.

Part No. 04972066 (pkg. 1)

Valco™ Graphite Vespel Ferrule

For use on Valco valve. 1/16 in. i.d.

Part No. 04974018 (pkg. 1)

Backflush Nozzle Accessory

Part No. L4275072

ATD 400/AutoSystem™ GC Interface Kit

Contains all necessary hardware for connecting the heated transfer line to either 1/8 in. packed or capillary columns inside the AutoSystem oven.

Part No. L4270026

Liquid Nitrogen Accessory

For operation of the cold trap to -100° C. **Note:** Requires a pressurized Dewar with a relief valve set at 25 psig (180 kpa). Dewar must have a 1/4 in. Swagelok™ connection. Also requires a pressure relief valve set at 50 psig (350 kpa) in pipe between Dewar and ATD 400.

Part No. L4270009

Internal Standard Injection Accessory

To allow the introduction of a gaseous internal standard.

Part No. L4270010

Interface Cables For ATD 400

Ready/Start Cable

Also transmits BCD.

Part No. L4270032

Nelson 900 Series Interface Box Cable

Also transmits BCD.

Part No. L4270034

ATD 400 to Agilent 6890 GC Ready/Start Cable

Connects an ATD 400 to a Agilent 6890.

Part No. N6100410

Cold Traps, Fittings, and Accessories

Cold Trap Tube (Low Flow) Unpacked

Cold trap with reduced bore at one end. Allows minimum gas flow during trap desorption.

Part No. L4275107 (pkg. 1)

Cold Trap Tube (Unpacked)

Standard cold trap tube unpacked.

Part No. L4271106 (pkg. 1)

Cold Trap Tube (Tenax™ TA)

Standard cold trap (L4271106) packed with Tenax TA 60/80.

Part No. L4275089 (pkg. 1)

Air Monitoring Trap

Low flow trap (L4275107) packed with carbonaceous sorbents suitable for ozone precursor and air toxics monitoring.

Part No. L4275108 (pkg. 1)

Trap Filter Disk

PTFE filter on either side of cold trap.

Part No. L4271160 (pkg. 1)

Trap Packing Disk

Glass fiber disk for separating sorbents when packing ATD cold trap with multiple sorbents. Recommended when using low flow trap.

Part No. L4271290 (pkg. 20)

Trap Packing Retaining Spring

For low flow trap.

Part No. N6301054 (pkg. 5)

Quartz Wool (Untreated)

Part No. N6102354 (5 g)

ATD Cold Trap Nuts

Two required per trap tube.

Part No. L4275009 (pkg. 1)

Graphite Ferrule

Ferrule for cold trap. Recommended for all applications except those using Mass Spec or ECD.

Part No. L4271187 (pkg. 2)

PTFE Ferrule

Ferrules for cold trap. Recommended for use with Mass Spec or ECD. **Note:** New ferrules are required when trap is changed.

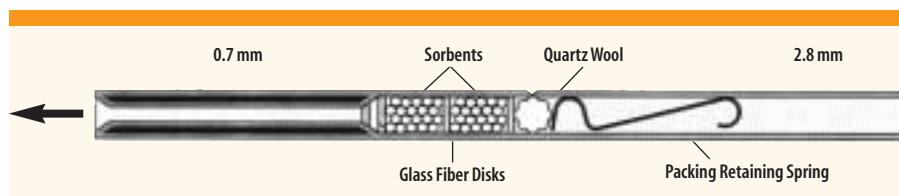
Part No. L4275110 (pkg. 10)

Cold Trap Packing Tool

Part No. L4271203

Cold Trap Removal Tool

Part No. L4271205



Low Flow Cold Trap

Ozone Precursor Accessories

Alumina Plot™ Column

50 m x 0.32 mm i.d.

Part No. N6301107

Methyl Silicone Column

50 m x 1.0 µm x 0.22 i.d.

Part No. N6301108

Restrictor Tubing

0.10 mm i.d. uncoated, deactivated, fused-silica restrictor tubing. For use in the ozone precursor analyzer.

Part No. N9301355

TurboMatrix Air Monitoring Trap

Trap packed with carbonaceous sorbents suitable for ozone precursor and air toxics monitoring.

Part No. M0413628

ATD 400 Air Monitoring Trap

Low flow trap packed with carbonaceous sorbents suitable for ozone precursor and air toxics monitoring.

Part No. L4275108 (pkg. 1)

TurboMatrix Air Monitoring Trap

Trap packed with carbonaceous sorbents suitable for ozone precursor and air toxics monitoring.

Part No. M0413628

Nafion Dryer

Part No. 04974414

Particulate Filter Kit

Includes disposable filter and fittings. For use in the ozone precursor analyzer.

Part No. N6300063

Model STS 25 Sequential Tube Sampler

The STS 25 is used for sequential sampling of air onto a series of up to 24 ATD sample tubes. It is a portable unit and can be operated either by a 12 V battery or 120 V/240 V. The sampler includes cables with jack plug connectors (for use with the monitoring pump) and a set of diffusion limiting caps. The STS 25 requires but does not include sample tubes and a monitoring pump. Also requires a 12 V battery or an electrical adapter.

Part No. L4280001

STS 25 Accessories

Personal Monitoring Pump

5-100 mL/min., 110 V.

Part No. N6102351

5-100 mL/min., 220 V.

Part No. N6102197

12 V Rechargeable Battery

Waterproof, suitable for outdoor use.

Part No. L4280002

Cable

For connecting the STS-25 to a generic 12 V battery.

Part No. L4285007

Electrical Adapter

Allows for direct connection to wall outlet. Also acts as a battery charger for 12 V battery (120 V/240 V).

Part No. L4280003

Diffusion Limiting Caps

Part No. L4285001 (pkg. 5)

Viton O-Ring

For use in diffusion limiting cap and tube seals.

Part No. L4275033 (pkg. 50)

STS 25 Rotor Filter Disk

Part No. L4281023 (pkg. 1)

STS 25 Maintenance Kit

Kit contains rotor tube seals (pkg. 50), filter disks (pkg. 25), diffusion limiting caps (pkg. 5), and rotor seal (pkg. 10).

Part No. N6609060 (kit)

Air Toxics Columns

Methyl Silicone Column

For use with Air Toxics™ (T014) Analyzer System with FID/ECD detectors. 100 m x 5 µm x 0.32 mm i.d.

Part No. N6300155

Methyl Silicone Column

For use with the Air Toxics (T014) Analyzer System with Q-Mass. 60 m x 5 µm x 0.32 mm i.d.

Part No. N9316000



AutoSystem™ Capillary Injector

1.800.561.4646 Canada

GC-15

www.perkinelmer.com/essentials

AutoSystem Series Split/Splitless Injector Add-on Kits

Complete Capillary Injector Add-on Kit for AutoSystem Series

Kit includes split/splitless injector in module with heater and sensor, 0-60 psig pressure regulator, and transducer for pressure readout. For manual gas control.

Part No. N6120009 (120 V)

Part No. N6120022 (240 V)

Capillary Injector with PPC for AutoSystem XL GC

Kit includes split/splitless injector with programmable pneumatic control for carrier gas, split vent, heater, sensor, and heater block. The AutoSystem XL must be PPC™ ready. If not, PPC upgrade kit (N6120146) is required. (See page GC-97 for more information.) Installation by PerkinElmer Service is required but not included.

Part No. N6120138 (120 V)

Part No. N6120139 (240 V)

Split/Splitless Injector Starter Kit for Manual Gas Control

Includes 2 mm i.d. quartz liner, 4 mm i.d. quartz liner, silicone O-Rings (10), Thermogreen septa (50), 0.5 mm graphite ferrules (10), 0.8 mm graphite ferrules (10), 1/16 in. stainless steel nuts (5), untreated quartz wool, packing rod, and wafer scribes (10).

Part No. N6120101

PreVent™ Add-on Kit

See page GC-21. Requires PPC.

Dual Capillary Column Adapter Kit

Kit includes all necessary hardware to install two capillary columns to a capillary injector. **Note:** Kit does not include appropriate 1/8 in. 2-hole ferrule. (See page GC-84.) For manual gas control.

Part No. N6120050 (120 V)

Accessories

Tool for Packing Quartz Liners

Part No. N610T100

Liner Removal Tool

Part No. N6100102

Quartz Wool (Untreated)

Part No. N6102354 (5 g)

Replacement Charcoal

(30/60 mesh)

Part No. 03300904 (2 oz.)

Column Ferrule Graphite/Vespel

1/16 in.

Part No. 09920105 (pkg. 10)

Column Nut 1/16 in.

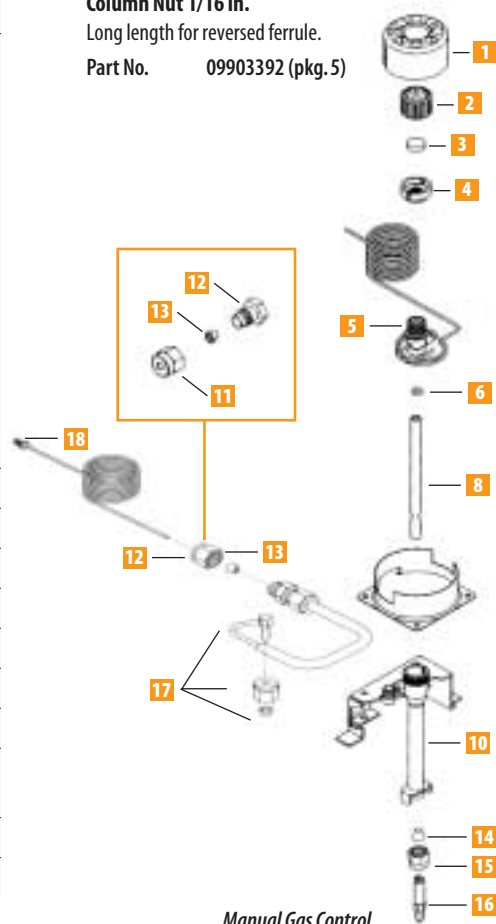
Long length for reversed ferrule.

Part No. 09903392 (pkg. 5)

Injector Replacement Parts

Description	Part No.
1 Injector Cover	N6101482
2 Septum Cap	N6100153
3 Thermogreen™ Septum (pkg. 50) *	N6621028
4 Injector Top Nut	N6101358
5 Injector Head	N6100158
6 O-Ring, Silicone for Glass Liner (pkg. 10, maximum injector temperature 250° C, shipped with instrument)	N6101374
O-Ring, Graphite for Glass Liner (pkg. 5, maximum injector temperature 450° C)	N6101378
O-Ring, KALREZ® for Glass Liner (pkg. 1, maximum injector temperature 450° C)	N9302782
O-Ring, Viton® for Glass liner (pkg. 1, maximum injector temperature 250° C, recommended for use with Mass Spec)	N9302783
8 Quartz Liner (2 mm) for Splitless Operation	N6121002
Quartz Liner (4 mm) for Split Operation or Large Volume Splitless Injection	N6121001
Glass Liner (2 mm) for Splitless Operation	N6101372
Glass Liner (4 mm) for Split Operation	N6101052
Deactivated Liner (2 mm, packed with wool) for Splitless Operation	N6121021
Deactivated Liner (4 mm, packed with wool) for Split Operation	N6121020
Deactivated Uniliner (4 mm, packed with wool)	N6121022
10 Injector Body	N6100047
11 1/8 in. Swagelok™ Nut Brass (pkg. 5)	N9300056
12 Restrictor	N6101034
13 1/8 in. Graphite/Vespel Ferrule (pkg. 10)	09920301
14 1/4 in. Graphite Ferrule (pkg. 10)	09920140
15 1/4 in. Swagelok Nut, Stainless Steel (pkg. 5)	N9300055
16 Injector Adapter	N6100157
17 Charcoal Trap	N6100275
Charcoal Trap for PPC Version (not shown)	N6100331
18 Split Vent Tube	N6100159

*For more septa, see page GC-20.



Manual Gas Control

Two programmable capillary inlets exist for the AutoSystem Series: the Programmed Split/Splitless (PSS), page GC-17, and the Programmed On-column (POC). These new temperature-programmable inlets expand the scope of the applications so that a majority of analytical requirements are met. Each of these inlets has its own application area where performance is optimum; it is up to the chromatographer to determine which is best suited for his needs.

Programmed-temperature On-column Inlet System

The AutoSystem Series Programmed-temperature On-column (POC) Inlet is designed to be used with fused-silica capillary columns. The sample is injected onto the column while the inlet is cool. After the injection, the inlet begins to heat. This delay in heating avoids the flash vaporization associated with a normal injection. This explosive vaporization can cause thermal breakdown and/or discrimination of certain analytes which can be avoided by using the POC.

The POC inlet is best to achieve recovery of compounds of greater than C_{60} (e.g., polywaxes). The POC utilizes flow control producing the best recovery out to C_{100} or greater.

POC Injector with Manual Flow Controller and Head Pressure Gauge

Kit includes all necessary hardware to install injector into AutoSystem Series.

Part No. N6120076 (120 V)*

Part No. N6120077 (240 V)*

POC Injector with Manual Flow Controller and Head Pressure Gauge with Flow Readout on Screen

Kit includes all necessary hardware to install injector into AutoSystem Series.

Part No. N6120082 (120 V)*

Part No. N6120083 (240 V)*

POC Injector with PPC™ Add-on Kit for AutoSystem XL

Kit includes injector with programmable pneumatic control, heater, sensor, and heater block. The AutoSystem XL must be PPC ready. If not, PPC upgrade kit (N6120146) is required. (See page GC-97 for more information.) Installation by PerkinElmer Service is required but not included.

Part No. N6120142 (120 V)

Part No. N6120143 (240 V)

TPI Subambient Add-on Kit

Temperature-programmable Inlet LN₂ Subambient accessory. For use with POC and PSS inlets. Requires but does not include LN₂ oven subambient accessory. Installation by PerkinElmer Service is required but not included.

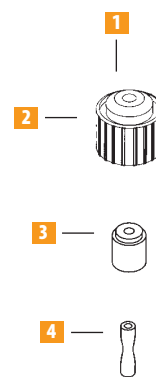
Part No. N6120078

Programmable On-column Injector Starter Kit

Includes needle guides (5), universal connectors (5), 0.53 mm i.d. deactivated fused silica (5 m), 1/16 in. stainless steel nuts (5), 0.8 mm graphite ferrules (10), Thermogreen™ septa (50), and wafer scribes (10).

Part No. N6120098

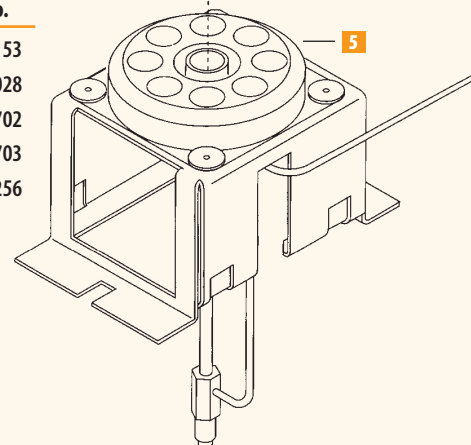
* Service installation suggested. AutoSystem firmware revision 1.7 or higher. Operator's manual (09938559) revision F or greater.



POC Replacement Parts

Description	Part No.
1 Septum Cap	N6100153
2 Septa (pkg. 50)**	N6621028
3 Needle Guide	N6101702
4 Liner/Hour Glass	N6101703
5 Body Assembly	N6100256

**For more septa see page GC-20.



AutoSystem Series Programmed-Temperature Split/Splitless Inlet System

The POC (page GC-16) and PSS provide greatly increased flexibility to help you meet all your application needs.

The programmed-temperature split/splitless (PSS) inlet allows accurate sample delivery to a capillary column. The PSS allows the analysis of thermally labile compounds while eliminating the discrimination of high-boiling compounds.

The PSS has four modes of operation: the *Split Mode*, for analyzing concentrated samples; the *Splitless Mode*, for trace analysis; the *Solvent Purge Mode*, used for achieving greater detection limits and cleaner chromatography; and the *On-column Mode*, for direct injection. One of the major advantages of the PSS is that any nonvolatile material will remain in the inlet liner and not on the front of the column.

In addition to the four modes of operation there are two modes of temperature programming: the *Oven Tracking Mode* and the *Inlet Mode*.

PSS Injector Add-on Kits for AutoSystem Series
PSS with pneumatics and pressure readout on screen. Kit includes all necessary hardware to install injector into AutoSystem GC.

Part No. N6120074 (120 V)**

Part No. N6120075 (240 V)**

PSS Injector with PPC for AutoSystem XL

Kit includes injector with programmable pneumatic control, heater, sensor, and heater block. The AutoSystem XL must be PPC ready. If not, PPC upgrade kit (N6120146) is required. (See page GC-97 for more information.) Installation by PerkinElmer Service is required but not included.

Part No. N6120140 (120 V)

Part No. N6120141 (240 V)

Programmable Split/Splitless Injector Starter Kit

Includes universal connectors (5), 0.53 mm i.d. deactivated fused-silica (5 m), 2 mm i.d. quartz liner, 1 mm i.d. quartz liner, glass hourglass liner, 1/16 in. stainless steel nuts (5), 0.5 mm graphite ferrules (10), 0.8 mm graphite ferrules (10), Viton® O-Rings (6), graphite O-Rings (5), untreated quartz wool, wafer scribes (10), and Thermogreen™ septa (50).

Part No. N6120102

PreVent™ Add-on Kit

See page GC-21.

TPI Subambient Add-on Kit

Temperature Programmable Inlet LN₂ Subambient accessory. For use with PSS and POC inlets. Instrument requires but does not include LN₂ oven subambient accessory.

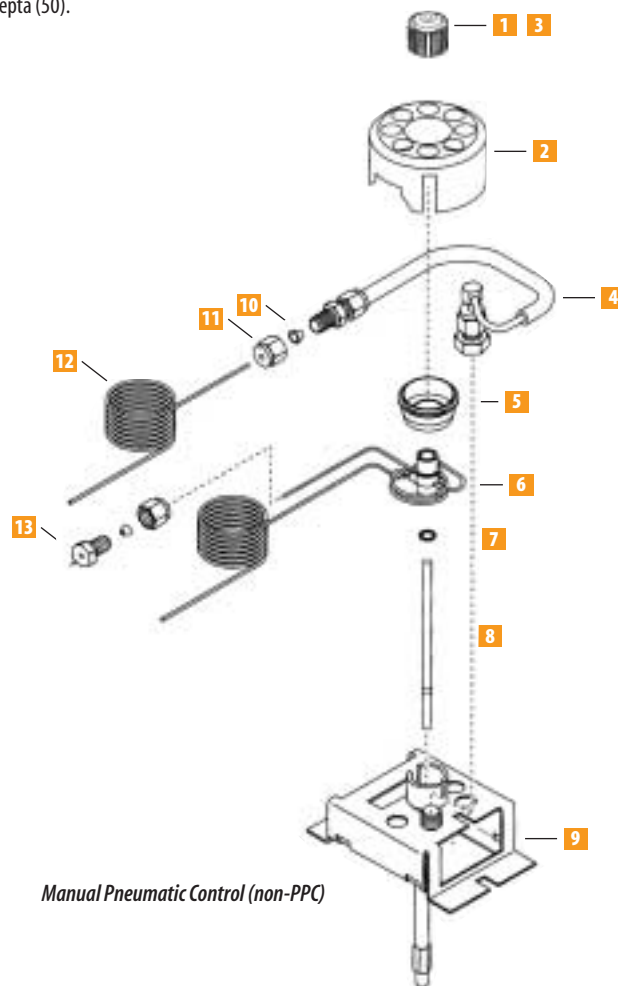
Part No. N6120078**

** Service installation suggested. AutoSystem firmware revision 1.7 or higher. Operator's manual (09938559) revision F or greater.

PSS Replacement Parts

Description	Part No.
1 Septum Cap	N6100153
2 Injector Cover	N6101482
3 Septa* (pkg. 50)	N6621028
4 Trap, Charcoal— non PPC™ version PPC version (not shown)	N6100275 N6100331
5 Nut	N6101715
6 Septum Purge	N6100260
7 O-Ring Viton (pkg. 10) max. temp. 250° C recommended for use with mass spec O-Ring KALREZ® (pkg. 1) max. temp. 450° C O-Ring Graphite (pkg. 5) max. temp. 450° C	N6101747 09921004 N6101751
8 Quartz liner, 2 mm Split Mode Quartz liner, 1 mm Splitless Mode On-column liner	N6121004 N6121006 N6101539
9 Body Assembly	N6100261
10 Ferrule 1/8 in. x 1/16 in. (pkg. 10)	09920301
11 Nut 1/8 in.	09903128
12 Split Vent Line	N6100159
13 Purge Restrictor	N6101034

*For more septa see page GC-20.



Manual Pneumatic Control (non-PPC)

Capillary Injector/PTV

1.800.762.4000 US

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PROGRAMMED TEMPERATURE VAPORIZER FOR THE 8000 SERIES

PTV Injector Replacement Parts

Description	Part No.
1 Glass Liners Borosilicate, Unpacked	N6002017
Borosilicate, Packed	N6002096
Quartz, Unpacked	N6002036
2 Graphite Ferrule	N6002037
3 N/A	N/A
4 N/A	N/A
5 PTFE-Septa (pkg. 50)*	00090652
6 Injector Septum Caps 8420/8500/8700	L4131283

*For more septa see page GC-20.

Miscellaneous Accessories

Replacement Charcoal Trap for 8400/8500/8700 Series GCs

Part No. L4135238

Replacement Trap for Sigma 2000/2100 GCs

Part No. N6000296

Activated Charcoal

Charcoal for repacking traps.

Part No. 03300904 (250 mg)

8000 SERIES SIGMA 2000/2100 SPLIT/SPLITLESS INJECTOR REPLACEMENT PARTS

2000/8000 Series Injector Replacement Parts

Description	Part No.
1 Injector Body 2000/8300	N6000215
Injector Body 8400/8500/8700	L4130171
2 Column Guide Insert	N6001300
3 Graphite Liner Seal (pkg. 10)	03305274
4 Glass Liner Borosilicate 2 mm Splitless	03305180
4 mm Split Mode	03305181
5 Injector Spring	03305179
6 Injector Needle Guide	03305177
7 PTFE Septa (pkg. 50)*	00090652
8 Septum Cap 8000s	L4131283
Septum Cap 2000s	N6001057

*For more septa see page GC-20.

8000 Series Complete Add-on Kits

Split/splitless injector module for 8400/8500/8700 GC
Kits includes: standard 1/8 in. fitting, ferrules, fittings to connect capillary column to inlet, and pneumatics for septum purge and split flow control.

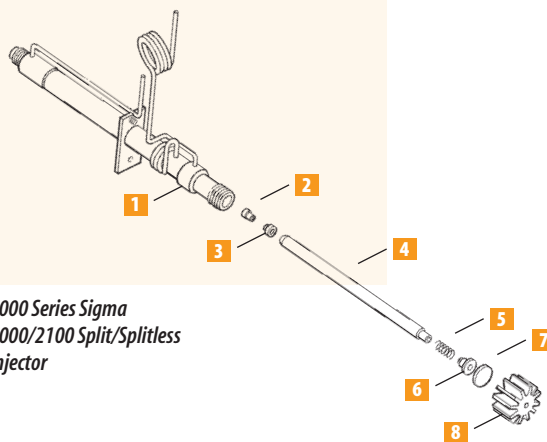
Part No. N6621042 (120 V)

Part No. L4191040 (240 V)

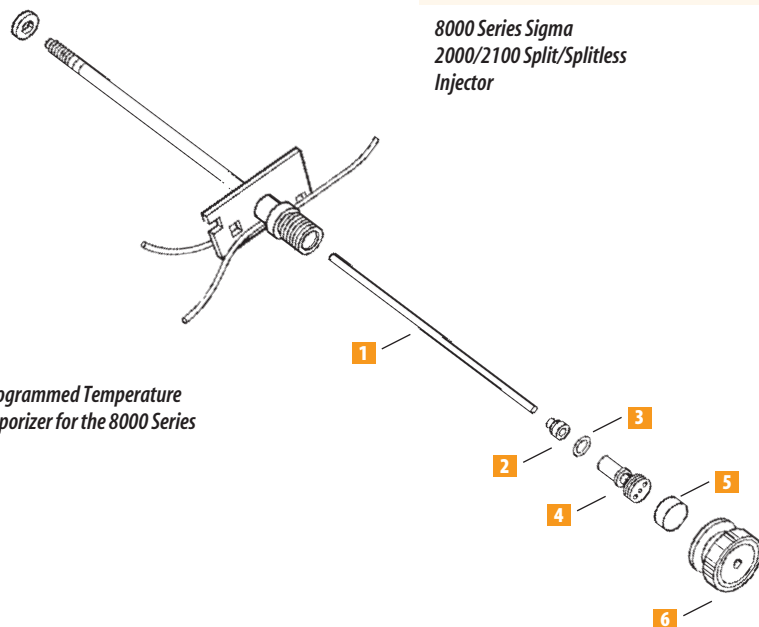
Silanized Glass Wool

Packing for wide-bore glass liners.

Part No. 03300905 (2 oz.)



8000 Series Sigma 2000/2100 Split/Splitless Injector



Programmed Temperature Vaporizer for the 8000 Series

AutoSystem™ Packed Column Injector

1.800.561.4646 Canada

AUTOSYSTEM SERIES PACKED COLUMN INJECTOR

PerkinElmer's proven injector design yields the best analytical results from your packed column. For glass or metal 1/8 in. or 1/4 in. packed columns or 0.53 mm capillary columns (see adapter kits to the right).

Complete Injector Add-on Kits for AutoSystem Series

Packed Column Injector Kit

Includes complete injector assembly with heater and sensor, 0-100 mL flow controller, and column head pressure gauge for installation into the AutoSystem.

Part No. N6120007 (120 V)

Part No. N6120023 (240 V)

Packed Column Injector Kit With Screen Readout

Includes complete injector assembly with heater and sensor, 0-100 mL flow controller and column head pressure gauge, and transducer for screen readout of column carrier flow.

Part No. N6120008 (120 V)

Part No. N6120025 (240 V)

Packed Column Injector with PPC™ for AutoSystem XL

The kit includes complete injector assembly with programmable pneumatic control, heater, sensor, and heater block. The AutoSystem XL must be PPC ready. If not, PPC upgrade kit (N6120146) is required. (See page GC-97 for more information.)

Part No. N6120136 (120 V)*

Part No. N6120137 (240 V)*

*Service installation required.

Packed Column Injector Starter Kit

Includes glass liner, needle guide, Thermogreen™ septa (50), untreated quartz wool, and packing rod.

Part No. N6120100

Special Injector Add-on Kits for AutoSystem XL

Packed Column Injector

The kit includes complete injector, heater, sensor, and heater block. (Does not include pneumatics.)

Part No. N6120071 (120 V)

Part No. N6120072 (240 V)

AutoSystem Wide-bore Adapter Kit

0.53 Capillary Column Adapter Kit

The AutoSystem Wide-bore Adapter Kit allows conversion of the packed inlet for 0.53 mm capillary column operation. The kit includes 0-20 mL flow control element, wide-bore adapter with 1/16 in. fitting, wide-bore glass liner, and column support hanger. Can be used in both on-column and off-column modes of operation.

Part No. N6120001

Wide-bore Adapter Accessories

Wide-bore Quartz Liner

Replacement glass liner (untreated) for use with the wide-bore adapter kit (0.53 mm columns).

Part No. N6121003

Wide-bore Glass Liner

Part No. N6101375

Flow Element (0-20 mL)

Flow element to convert non-PPC flow controller for low carrier flow application.

Part No. N6101377

Graphite/Vespel Ferrule

Reverse ferrules used to connect 0.53 mm capillary columns to wide-bore adapter kit. 1/16 in. fitting. Reverse ferrule 1/16 in. x 0.8 mm i.d.

Part No. 09920107 (pkg. 10)

Graphite Ferrule

Reverse ferrules used to connect 0.53 mm capillary columns to wide-bore adapter kit. 1/16 in. fitting. Reverse ferrule 1/16 in. x 0.8 mm i.d.

Part No. 09920141 (pkg. 10)

Miscellaneous Accessories

Injector/Detector Adapter 1/4 in.

Adapter fits on injector outlet (inside oven) for use with 1/4 in. columns.

Part No. 00080100

Liner Removal Tool

Allows easy removal of glass liners from injector port.

Part No. N6100102

Quartz Wool

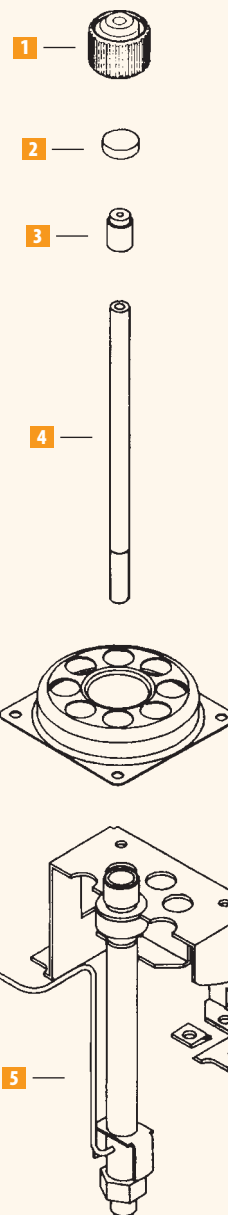
Quartz wool (untreated) for packing glass liners.

Part No. N6102354 (5g)

Injector Replacement Parts

Description	Part No.
1 Septum Cap	N6100153
2 Septa Thermogreen (pkg. 50)*	N6621028
3 Needle Guide	N6101050
4 Glass Liner Quartz Liner	N6101048 N6121000
5 Packed Injector Assembly	N6100048

*For more septa see page GC-20.



Packed Column Injector and Injector Septa

1.800.762.4000 US

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PACKED COLUMN INJECTOR PARTS FOR:

- 8000 Series
- 2000/2100 Series
- SIGMA 1B-4B and 300

Wide-bore Adapter Kits

8000 Series 0.53 mm Wide-bore Kit

Kit includes injector adapter, column support, low-flow adapter, ferrules, and instructions. For use with 8000 Series GCs only.

Part No. N6022502

Sigma Series 0.53 mm Wide-bore Kit

Kit includes special adapter liner with 1/16 in. column fitting, graphite/vespel ferrules, and instructions. For use with Sigma 1B-4B, 300, 2000/2100 Series, or 8000 Series GCs only.

Part No. 03320146

Wide-bore Accessories

Flow Accessory Kit (0-10 mL)

Contains restrictor required to modify carrier flow controller for low operation.

Part No. N6023031

Detector Receiver 1/16 in.

Capillary column detector receiver 0.8 mm i.d. with 1/16 in. column fitting. For use on Sigma 1B-4B, 300, 2000/2100, and 8000 Series GCs only.

Part No. N6020024

Column Nut 1/16 in.

Replacement 1/16 in. column nut. Connects capillary column to wide-bore adapter liner.

Part No. 09903392 (pkg. 5)

Ferrules

Graphite/Vespel 1/16 in.

1/16 in. x 0.8 mm i.d. for connecting capillary columns to adapter liner.

Part No. 09920107 (pkg. 10)

Graphite 1/16 in.

1/16 in. x 0.8 mm i.d. for connecting capillary columns to adapter liner.

Part No. 09920141 (pkg. 10)

Graphite/Vespel 1/4 in.

For installing liner into injector.

Part No. 09903739 (pkg. 10)

Septa for Use With All Injectors

PTFE-Silicone Injector Septa

Maximum recommended operating temperature 300° C. 11 mm diameter.

Part No. 00090652 (pkg. 50)

Part No. 00091357 (pkg. 12)

BTO™ (Bleed Temperature Optimized) Injector Septa

Maximum recommended operating temperature 300° C. Low bleed, high temperature. 11 mm diameter.

Part No. N9302972 (pkg. 50)

Thermogreen™ Injector Septa

Maximum recommended operating temperature 350° C. Low bleed, high temperature. 11 mm diameter.

Part No. N6621028 (pkg. 50)

Low Bleed Injector Septa

Maximum recommended operating temperature 320° C. 11 mm diameter.

Part No. N9303343 (pkg. 50)

Silicone Injector Septa

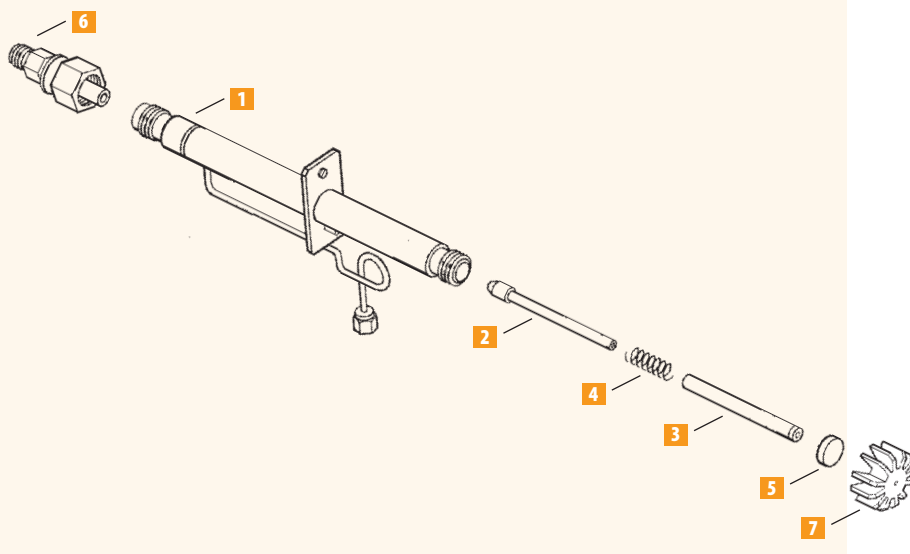
Maximum recommended operating temperature 250° C. 11 mm diameter.

Part No. 54019985 (pkg. 50)

Packed Column Injector Replacement Parts

Description	8000 Series Part No.	Sigma 2000/2100 Part No.	Sigma 1B-4B, 300 Part No.
1 Injector (complete assembly)	N6621023	N/A	N/A
2 Glass Liner	03302221	03302221	03302221
Small-bore Glass Liner	03302243	03302243	03302243
3 Injector Sleeve	03300517	03300517	03300517
4 Injector Spring	00091059	00091059	00091059
5 Septum PTFE Faced (pkg. 50)*	00090652	00090652	00090652
6 Column Adapter (1/8 in.)	N6000251	N6000251	N/A
Column Adapter (1/4 in.)	N6000252	N6000252	N/A
7 Septum Cap	L4131283	N6001057	N/A

*For more septa see above.



- **Faster Analysis**
- **Increased Uptime**
- **Extended System Life**

PerkinElmer's PreVent is a unique, innovative productivity tool for gas chromatography. Almost every GC analysis, from routine operations to the most demanding research applications, will benefit significantly from this revolutionary technique. PreVent offers four modes of operation for improving chromatographic performance.

- **Isolation Mode** – eliminates downtime during routine injector maintenance. Can provide approximately 100 extra analytical hours of productivity per system per year.
- **ELVI Mode** – facilitates manual injection volumes up to 150 µL and automatic injection volumes up to 50 µL without solvent reaching the column or detector. Offers unparalleled sensitivity and eliminates lengthy sample preparation.
- **Time-saver Mode** – prevents unwanted, high molecular weight material from reaching the detector. Shortens analysis time, facilitates isothermal chromatography and protects the detector from contamination. Allows changing of the analytical column without venting the mass spectrometer.
- **ProTect Mode** – eliminates contamination by preventing heavy components in the sample from reaching the expensive and retentive chromatographic column. Allows backflushing during chromatographic run.

PreVent Add-on Kit

Kit includes all necessary hardware to add PreVent capability to an existing PSS injector with PPC™ or to a capillary injector with PPC. Includes restrictor and mid-point PPC module.

Part No. N6120144

PreVent Restrictor – 0.06 mm i.d., 108 mm Length

Part No. N6103080

PreVent Restrictor – 0.06 to 0.25 mm i.d., 104 mm Length

Part No. N6100342

PreVent Spacer

Part No. N6103079

PreVent Hourglass Guide

Part No. N6103082

Isolation Mode

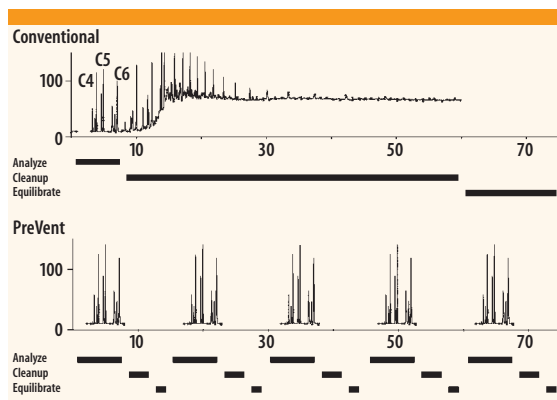
Isolation Mode allows the injector to be disassembled for routine maintenance (changing the liner or septum, for example) while chromatography is in progress. The flow of carrier gas is not disturbed and air does not enter the system. Isolation mode is particularly suited for applications using electron capture (ECD) or mass spectrometric (MS) detectors, which would otherwise require extended cool-down periods and re-equilibration times.

Time-saver Mode

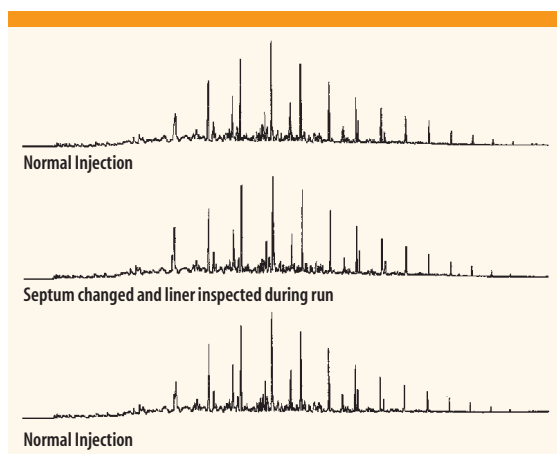
Time-saver Mode reduces analysis times for volatile target analytes in samples which contain high-boiling compounds. By preventing high-boiling components from reaching the detector, significant cost savings and productivity enhancements can be achieved.

Enhanced Large Volume Injection Mode

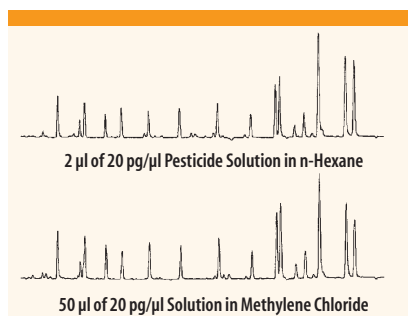
The Enhanced Large Volume Injection Mode is compatible with liquid sample volumes up to 150 µL injected manually, and 50 µL by Autosampler. This facility enhances detection limits significantly and reduces the need for sample pre-concentration. On an AutoSystem XL with PSS, the sample is introduced while the inlet is cool and the split vent is open. The majority of the solvent is then purged from the system through the split vent. The vent is then closed, the injector heated, and the analytes transferred, without splitting, onto the analytical column.



Chromatogram for PreVent time-saver mode.



Three successive injections of diesel oil.



Enhanced Large Volume Injection allows the use of chlorinated solvents with an electron capture detector.

AutoSystem/AutoSystem XL Syringes

50 µL Syringe

Recommended Use	Needle o.d.	Part No.
Metal plunger in barrel type.	0.63	N6101760

5 µL Syringes

Recommended Use	Needle o.d.	Part No.
Routine analyses. Shipped standard with instrument. Plunger type: metal plunger in barrel with Teflon®-tipped seal.	0.63	N6101390*
Routine analyses. Plunger type: metal plunger in barrel.	0.63	N6101251
0.53 capillary on-column injection. Plunger type: metal plunger in barrel.	0.47	N6101380

*Shipped standard with instrument.

0.5 µL Syringes

Recommended Use	Needle o.d.	Part No.
Low injection volume analyses. Plunger type: metal plunger in needle type.	0.63	N6101252
Low injection volume. 0.53 capillary on-column injection. Plunger type: metal plunger in needle type.	0.47	N6101253

Replacement Needles for 0.5 µL Syringes

Needle o.d.	Part No.
0.63	N6101469
0.47	N6101470

Miscellaneous Accessories

Autosampler Starter Kit

Includes 5 µL x 0.63 mm o.d. syringe, 2 mL clear sample vials (100), 2 mL amber sample vials (100), blue crimp caps with septa (100), green crimp caps with septa (100), red crimp caps with septa (100), septa for waste/wash vials (100), crimper – 11 mm, decapper – 11 mm, 2 mL vial rack.

Part No. N6120105

Spare Autosampler Tray

Part No. N6120031

Autosampler Thermostatting Accessory

Allows thermostatting of AutoSystem Autosampler tray from 10 to 50° C. Accessory includes: tubing, tie wraps, clamp, and instructions. (Circulating bath not included.)

Part No. N6120036

AutoSystem Autosampler Add-on Accessory

Includes all the necessary parts to add an Autosampler to an AutoSystem Gas Chromatograph. **Note:** Cannot be installed on instruments manufactured prior to June 1992 or on AutoSystem XLs. Service installation is highly recommended. GC should be upgraded to firmware revision 1.9 (Part No. N6100292).

Part No. N6120109

AutoSystem XL Autosampler Add-on Accessory (Brown Color)

Includes all the necessary parts to add an Autosampler to an AutoSystem XL Gas Chromatograph. **Note:** Can not be installed on an AutoSystem. Service installation is highly recommended.

Part No. N6120160

AutoSystem XL Autosampler Add-on Accessory (White Color)

Same as N6120160 except in new white color. **Note:** Can not be installed on an AutoSystem. Service installation is highly recommended.

Part No. N6120181

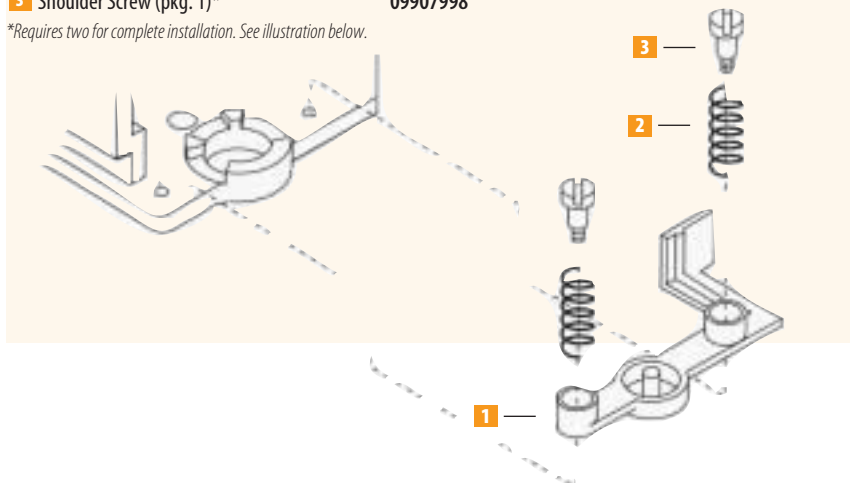


5 µL Syringe for Autosystem (N6101390)

AutoSystem/AutoSystem XL Autosampler Replacement Parts

Description	Part No.
1 Replacement Vial Locator (may require service installation, not included)	N6101182
2 Spring (pkg. 1)*	N6101183
3 Shoulder Screw (pkg. 1)*	09907998

*Requires two for complete installation. See illustration below.



Autosampler Replacement Parts and Supplies

1.800.762.4000 US

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AS-300/AS-2000B/AS-8300 Autosampler Spares Kit

Part No. 03300796

Kit includes:

Description	Part No.
3 µL Syringe Assembly	03303477
Syringe Septum	03302339
Sample Probe Assembly	03303611
Septum Penetrating Tool	03302448
Waste Bottle	N/A
Waste Bottle Cap	N/A

AI-1 Auto Injector Replacement Parts

Description	Part No.
Syringe Valve Packing	N6002195
Front Needle Packing	03303472
Syringe Septum	03302339

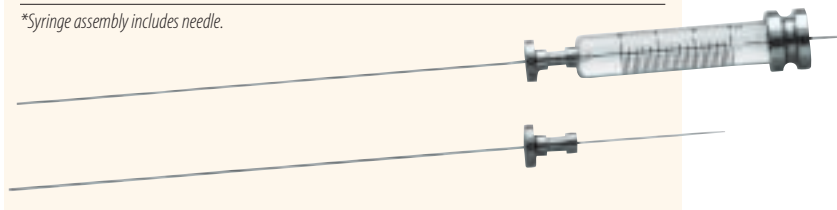
Autosampler Syringes for On-column Injection with Wide-bore Capillary Columns

Description	Part No.
Spare 0.47 mm Needle only	N6002218
Replacement Syringe with Needle (0.47 mm)	N6002212
Spare Waste Diverter (0.47 mm needle)	N6002213

AS-100/AS-300/AS-2000/AS-8300 Syringes and Needles

Syringe Assembly* Size	Part No.	Replacement Needle Part No.
3 µL	03303477	N6002124
5 µL	03303500	N6002181
10 µL	N/A	N6002182

*Syringe assembly includes needle.



Wide-bore Syringe Kit (3 µL)

For use with viscous samples, fits all model liquid Autosamplers except AutoSystem GC.

Syringe and Needle

Part No. 03320134

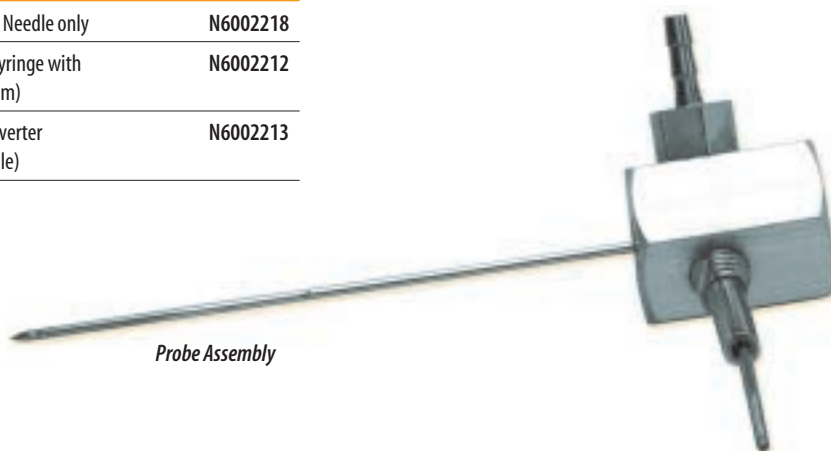
Replacement Needle

Part No. N9301366

Replacement Probe Assembly

For Autosampler Model, AS-2000B/AS-300/AS-8300 (low volume).

Part No. 03303611



Probe Assembly

PerkinElmer offers subambient systems which are microprocessor controlled. This control allows precise injection of coolant for the greatest accuracy. Our design assures you of minimum thermal gradients, thereby eliminating the peak splitting often found in other systems.

NOTE: All of the subambient systems require, but do not include PerkinElmer Service installation.

Pressure Ratings

LN₂ 20-30 psi

CO₂ 50-70 psi

AutoSystem™ GC Subambient Accessories

Liquid Carbon Dioxide (CO₂) Subambient Accessory

Contains all of the necessary hardware to add subambient capability. Capable of operating down to -50° C. Installation by PerkinElmer Service is required but not included.

Part No. N6120017

Liquid Nitrogen (LN₂) Subambient Accessory

Contains all of the necessary hardware to add subambient capability. Capable of operating down to -99° C. Installation by PerkinElmer Service is required but not included.

Part No. N6120016

Liquid Nitrogen (LN₂) Subambient Accessory for Temperature Programmable Injectors

Contains all of the necessary hardware to add subambient capability to two temperature programmable injectors (PSS/Program Split Splitless, POC/Program On-column) on one Gas Chromatograph. Capable of operation down to -99° C. Requires but does not include oven LN₂ subambient. Installation by PerkinElmer Service is required but not included.

Part No. N6120078

AutoSystem XL GC Subambient Accessories

Liquid Carbon Dioxide (CO₂) Subambient Accessory

Contains all the necessary hardware to add subambient capability to AutoSystem XL. Operating temperature range down to -50° C. Installation by PerkinElmer Service is required but not included.

Part No. N6120159

Liquid Nitrogen (LN₂) Subambient Accessory

Contains all the necessary hardware to add subambient capability to AutoSystem XL. Operating temperature range down to -99° C. Installation by PerkinElmer Service is required but not included.

Part No. N6120158

8000 Series Subambient Accessories

Liquid Nitrogen (LN₂) Subambient Accessory

Contains all necessary hardware to install subambient capability to 8000 Series GC. Capable of operating down to -80° C. Installation by PerkinElmer Service is required but not included.

Part No. N6621124

Liquid Carbon Dioxide (CO₂) Subambient Accessory

Contains all necessary hardware to install subambient capability to 8000 Series GC. Capable of operating down to -30° C. Installation by PerkinElmer Service is required but not included.

Part No. N6621125



TurboMass Gold Mass Spectrometer is the fastest, widest mass range quadrupole mass spectrometer available for GC/MS. State-of-the-art Pentium electronics process more scans across each peak, resulting in unmatched accuracy and precision, and better overall spectral fidelity. This coupled with unique productivity tools provides the functionality necessary to achieve optimum performance, completing work quickly, easily, and efficiently. The wide mass range and flexible data acquisition modes help tackle the most complex applications while rugged instrument design delivers maximum uptime, easy maintenance, and lower operating cost.

Combine the TurboMass Gold with the AutoSystem™ XL gas chromatograph, market-leading TurboMatrix™ sample handling accessories, flexible user-friendly software, and world-class service and support for an integrated, complete analytical solution from one familiar name – PerkinElmer. Whatever your application – Environmental, Chemical, Petrochemical, Flavor and Fragrance, Food, Beverage, Forensic, Pharmaceutical – PerkinElmer delivers the accuracy and precision you need.

TurboMass Gold Benefits

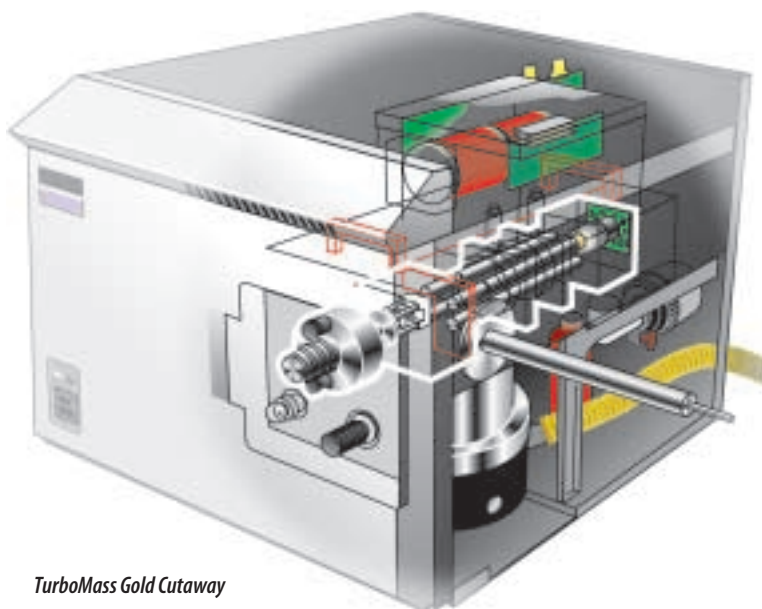
- **Fastest Scan Rates** – unprecedented speed with better chromatographic peak definition ensuring better quality results. Opens the use of quadrupole technology to fast GC applications.
- **Widest Mass Range** – uncompromised performance over a wide mass range.
- **SIFI Scanning Mode** – selected Ion Monitoring (SIM) and full scan in the same run resulting in the most complete characterization of the sample. No need to run the sample twice.
- **Gold Component Technology** – improved stability and reduced maintenance.
- **Easy Access Ion Source** – less than 15-minute changeover.
- **Sealed, Long-life Photomultiplier** – eliminates expensive replacement costs of electron multipliers. Better reliability.

Flexible Column Choices

Because TurboMass Gold allows a carrier gas flow of up to 5 mL per minute in EI, you have more column choices than with other GC/MS systems. Narrow-, medium-, and wide-bore columns can be used, with almost unlimited choice of stationary phase, diameter, and analytical method with TurboMass Gold.

Column	Internal Diameter	Typical Flows	TurboMass Gold	Others
Narrow-bore	0.10 to 0.18 mm i.d.	0.1 to 0.8 mL/min	X	X
Medium-bore	0.25 mm i.d.	1 to 1.5 mL/min	X	X
Wide-bore*	0.32 to 0.53 mm i.d.	3 to 5 mL/min	X	

**Columns with low pneumatic impedance may require attachment of additional length of deactivated fused-silica capillary tubing to provide proper pressure drop from injector to mass spectrometer (Part Nos. N9301354, N9302149, and N9301343).*



TurboMass Gold Cutaway

The TurboMass Gold and TurboMass Mass Spectrometer are benchtop mass spectrometric detectors with the performance you require to do your job easily, quickly, and efficiently. As detectors for the AutoSystem™ XL gas chromatograph, they can provide the answers for the mass spec analyses you run every day.

Ionizer Replacement Parts

TurboMass Gold Extra EI Inner Ion Source Assembly (Rhenium)

Part No. E6400207

TurboMass Gold Extra PCI/NCI Inner Ion Source Assembly (Rhenium)

Requires PCI or PCI/NCI configuration option.

Part No. E6400208

TurboMass Extra EI Innersource Assembly (Tungsten)

Part No. N6470207

TurboMass Extra PCI/NCI Inner Ion Source Assembly (Tungsten)

Part No. N6470208

Extra Outer Ion Source and Optics Assembly

Part No. E6400206

Ion Source O-Ring Seal

Part No. E5711272

Filament Assembly and Standard Tungsten Filament

For use with TurboMass Mass Spectrometers only.

Part No. E6400209

Standard Rhenium Filament

Part No. N6470012

Trap Contact

Part No. E6401217

Ion Source Heater Assembly

Part No. E6400265

Ion Source Thumbscrew

Part No. E6070836

Ion Volume Replacement Parts

Description	Part No.
Extra EI repeller	E6401219
Extra EI electron trap	E6401220
Ion exit plate	E6401213
CI ion exit plate	E6401214
Extra EI ion volume	E6400211
Extra CI ion volume	E6401208

AutoSystem XL GC Transfer Line

Description	Part No.
Transfer line carrier tube	E6401308
Transfer line 1/8 in. nut	E6401309
Transfer line O-Ring	E5711269

Cables

GC to MS Interface Cable

Part No. E6400242

GC Start/Ready Cable

Part No. E6400247

Computer to MS Cable

For use with TurboMass Mass Spectrometers only.

Part No. E6400251

Cable, RS232, 7 ft. Length (185 cm)

Personal computer to AutoSystem Integral (included with TurboMass Gold).

Part No. S5010025

Cable, RS232, 25 ft. Length (660 cm)

Personal computer to AutoSystem Integral LINK.

Part No. S5010030

Ethernet Cable

For TurboMass Gold Mass Spectrometers only.

Part No. 09991463

Ethernet Hub for TurboMass Gold

Part No. N6471012

Ethernet Hub Power Supply (220 V) for TurboMass Gold

Part No. 09998293

Ferrules

0.4 mm i.d. Graphite/Vespel Ferrule

For column to interface connection (1/16 in. nut size).

Part No. 09920104

0.5 mm i.d. Graphite/Vespel Ferrule

For column to interface connection (1/16 in. nut size).

Part No. 09920105

0.7 mm i.d. Graphite/Vespel Ferrule

For column to interface connection (1/16 in. nut size).

Part No. 09920107

1/16 in. Blanking Plug

No hole, for transfer line.

Part No. 09920511

Graphite Vespel

For transfer line. 1/4 in. i.d., 1/4 in. nut.

Part No. 09903739

Miscellaneous

Forepump Oil

Part No. 09923492

GC/MS Sensitivity Test Mix

Includes standard solutions of benzophenone, hexachlorobenzene, and octafluoronaphthalene for testing instrument sensitivity.

Part No. E6401017

Glass Bulb for Reference Gas

Part No. E6401240

FC-43 Tuning Compound

Part No. N6212407

Vinyl Gloves (Unpowdered)

Part No. N6212495

Quadrupole Heater Assembly

Part No. E6400265

Copper Tubing, Precleaned

Part No. N9300077

Gas Purifier for GC/MS

Part No. N6471025

TurboMass Vacuum Filter Kit

Includes Foreline Adsorption Trap (09923493), Nipple NW25 Extension Tube (09920864), NW25 Clamp Ring (09923491), NW25 Centering Ring (09923490), Installation Instructions (09936442), Activated Alumina Reagent-replacement (09923504).

Part No. E6420021

Detectors

TurboMass™ Gold and TurboMass Mass Spectrometer

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Software

TotalChrom™ Workstation Reprocess-only Kit for TurboMass Mass Spectrometers Only

Allows data collected from a conventional detector via TurboMass software to be analyzed with TotalChrom Workstation Chromatography Data System software. Includes CD and 3.5 in. diskette media, user manuals, mouse pad, and installation instructions.

Part No. S2701116

TurboMass Single Additional Workstation License

Allows TurboMass software to be run on one additional computer. Does not include manuals. **Note:** Network setup is the responsibility of the customer.

Part No. S2701017

TurboMass Five Additional Workstation Licenses

Allows TurboMass software to be run on five additional computers. Does not include manuals. **Note:** Network setup is the responsibility of the customer.

Part No. S2701018

NIST Mass Spectral Library

Part No. E6420001

Wiley Mass Spectral Library

Does not include the NIST library.

Part No. E6420003

Pfleger/Maurer/Weber Drug and Pesticide Spectral Library

Part No. 04308523

Upgrade Kits

El to PCI/NCI Upgrade

Includes CI ion source, reagent gas tubing, flow regulators, valves and solenoids, and dual-polarity electronic options. Installation by PerkinElmer Service is required but not included.

Part No. E6420007

TurboMass Gold Manuals

TurboMass Gold Manual Kit

Includes User's Guide-EPCAS software, User's Guide-EPCAS hardware, and TurboMass Gold Tutorial.

Part No. 09934472

TurboMass Gold Software User's Manual

Part No. 09934468

TurboMass Gold Hardware User's Manual

Part No. 09934469

TurboMass Gold Tutorial Manual

Part No. 09934470

TurboMass Manuals

TurboMass Software User's Manual

Part No. S2701610

TurboMass Hardware User's Manual

Part No. 09936341



TurboMass Gold

Q-Mass 910 Accessories

Quick Change Electron Multiplier Assembly

Includes continuous dynode electron multiplier mounted on vacuum flange.

Part No. N6331320

Quick Change Disposable Ionizer Assembly

Includes ion optics, ion volume, and filament.

6 V tungsten.

Part No. N6331339

6 V rhenium.

Part No. N6330100

24 V rhenium.

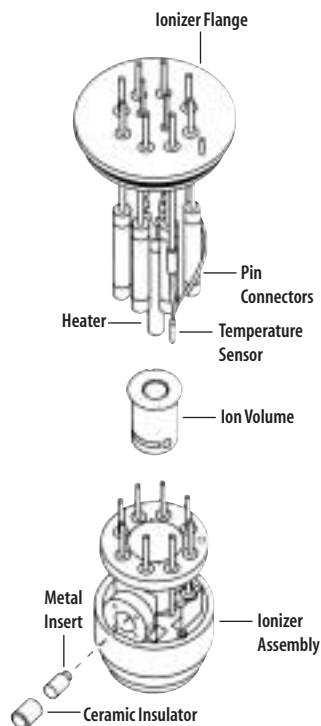
Part No. N6330101

Ion Gauge and Controller (240 V)

Part No. N6331208

Jet Separator AutoSystem, with 115 V Pump

Part No. N6330084



Q-Mass 910 Analyzer Ionizer Replacement Parts

Analyzer Ionizer

Description	Part No.
Complete Ionizer w/Heater and Sensor (6 V), tungsten	N6331435
Complete Ionizer w/Heater and Sensor (6 V), rhenium	N6330102
Ionizer Heater (6 V)	N6331316
Ion Volume (6 V)	N6331346
Ion Volume (24 V)	N6331531
O-Ring (1 1/4 in.)	N6331405

Mechanical and Electrical Parts

Description	Part No.
Turbomolecular Pump, 50 L/sec.	N6331398
Turbomolecular Pump Controller	N6331411

Q-Mass 910 Mechanical Pump Replacement Parts

Mechanical Pump

Description	Part No.
Mechanical Pump, 127 L/m in. (240 V)	N6331423
Vacuum Pump Oil	N6212351

Mechanical Parts and Vacuum System

Description	Part No.
Viton Centering Ring KF10/16	N6331400
Vent Valve Centering Ring	N6331395
Copper Gasket (3 3/8 in.)	N6331376

Calibration Gas/Standards

Description	Part No.
Calibration Compound Chamber, Glass Bulb	N6331345
Calibration Compound, (FC-43, PFTBA, PTA)	N6212407
Methyl Stearate, Test Sample, 1 + 100 ng/μl	N9300082

Ferrules

Description	Part No.
Vespel/graphite 1/16 in. to 0.4 mm (pkg. 10)	09920104
Vespel/graphite 1/16 in. to 0.5 mm (pkg. 10)	09920105
Vespel/graphite 1/16 in. to 0.8 mm (pkg. 10)	09920107
Vespel/graphite 1/16 in. (pkg. 10)	09920127

Software

NIST/EPS/MSDC Mass Spectral Library Upgrade Kits

Upgrades version 3.1 of NIST to 4.1.

Part No. N6330069

Upgrade Version 4.1 of NIST to 4.5.

Part No. N6330078

Miscellaneous

Description	Part No.
Q-Mass Mouse Pad	N9301395
Eraser Brush-Pencil	09923078
Ceramic Column Cutter	N9301376
Cotton Applicators	N9301272
Vinyl Gloves (pair/unpowdered)	N6212495
Septa, low bleed (pkg. 50)*	N9302972

*For more septa see page GC-20.

Detectors

Ion Trap Detector (ITD)

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ITD Replacement Parts

Description	Part No.
Manifold Flange Gasket Cu (4.5 in.)	N6212332
Compression Spring (pkg. 3)	N6212347
Vacuum Pump Oil (1 L)	N6212351
Filament Disk Assembly (pkg. 1)	N6212372
Oil, Turbo Pump (25 mL)	N6212403
Calibration Compound FC-43 (3 g)	N6212407
Aluminum Oxide, 50 g (pkg. 2)	N6212408
Gate Insulator (pkg. 1)	N6212411
Filament Gasket Gold, 2.12 in. (pkg. 1)	N6212415
Gate Plunger (pkg. 1)	N6212416
Transfer Line Flow Restrictor (pkg. 1)	N6212421
Connections ITD Filament (pkg. 1)	N6212373
Electron Multiplier Assembly (pkg. 1)	N6212429
Tweezers (pkg. 1)	09908400
Septa, Low Bleed (pkg. 50)*	N9302972

*For more septa see page GC-20.

ITD Accessories

Description	Part No.
Gate Insulator (pkg. 1)	N6212411
Gate Plunger (pkg. 1)	N6212416
Vented Screw (pkg. 2)	N6212420
Compression Spring (pkg. 3)	N6212347

Glass Liners for Open-split Interface

Description	Part No.
For 0.25 mm i.d. Columns	N6212475
For 0.53 mm i.d. Columns	N6212477

ITD Accessory Kits

Manifold Insert Kit

Kit includes manifold insert body and tube (1), plug (1), adapter spring (1), and vinyl gloves (2 pairs).

Part No. N6212473

ITD Filament Replacement Disks

ITD Filament Disk Refill Kit

Part No. N6212372

First Time Conversion Kit

Part No. N6212374

ITD/AutoSystem™ Interface Kit

Kit includes all necessary hardware to connect an ITD to an AutoSystem GC through a detector position.

Part No. N6120034

Ferrules

Graphite/Vespel, 1/16 in. x 0.4 mm

For transfer line 0.25 mm column.

Part No. 09920104 (pkg. 10)

Graphite/Vespel, 1/16 in. x 0.5 mm

For transfer line 0.32 mm column.

Part No. 09920105 (pkg. 10)

Graphite/Vespel, 1/16 in. x 0.5 mm

For transfer line 0.53 mm column.

Part No. 09920107 (pkg. 10)

Graphite/Vespel, 1/4 in. x 0.4 mm

For transfer line manifold.

Part No. N6212350 (pkg. 1)

Graphite/Vespel, 1/4 in.

For line liner open-split interface.

Part No. N6212329 (pkg. 1)



Auto-ignite FID Add-on Kits

Auto-ignite FID without PPC Add-on Kit for the AutoSystem XL

Kit includes detector assembly with heater and sensor, heater block, igniter, hydrogen pressure regulator, and needle valve. Requires but does not include amplifier (N6120162). Requires AutoSystem XL to have firmware revision 3.3 or higher. **Note:** AutoSystem XL GC's shipped prior to January 1997 require a new detector cover.

Part No. N6120165 (120 V)

Part No. N6120166 (240 V)

Auto-ignite FID with PPC Add-on Kit for the AutoSystem XL

Kit includes detector assembly with heater and sensor, heater block, igniter, programmable pneumatics, and controls for detector combustion gases. Requires but does not include amplifier (N6120162) and AutoSystem XL firmware revision 3.3 or higher. The AutoSystem XL must be PPC ready. If not, PPC upgrade kit (N6120146) is required. **Note:** AutoSystem XL GC's shipped prior to January 1997 require a new detector cover. Installation by PerkinElmer Service is required but not included.

Part No. N6120167 (120 V)

Part No. N6120168 (240 V)

FID Amplifier

Required for use with FID Detector Add-on Kit.

Part No. N6120162

AutoSystem Series Operation Kit

TCD/FID Series Operation Kit

Used to direct sample effluent from the TCD to the FID.

Part No. N6120006

PID/FID Series Operation Kit

Used to direct sample effluent from the PID to the FID.

Part No. N6120059

Miscellaneous Accessories

1/4 in. Packed Column Adapter

For use with 1/4 in. packed columns. 1/8 in. to 1/4 in. adapter fits both injector and detector ends.

Part No. 00080100

Capillary Column Adapter

For capillary column use with the FID 1/8 in. to 1/16 in. detector adapter.

Part No. N6120020

Replacement Stainless Steel Glow Plug for Auto-ignite FID

Part No. N6103089

Auto-ignite Nozzle Replacement Tool

For removing nozzle from auto-ignite FID body.

Part No. N6103188

Jet Replacement Tool

1/4 in. nut driver for removing jet from auto-ignite FID body.

Part No. N6101297

Detector Cover (White Color)

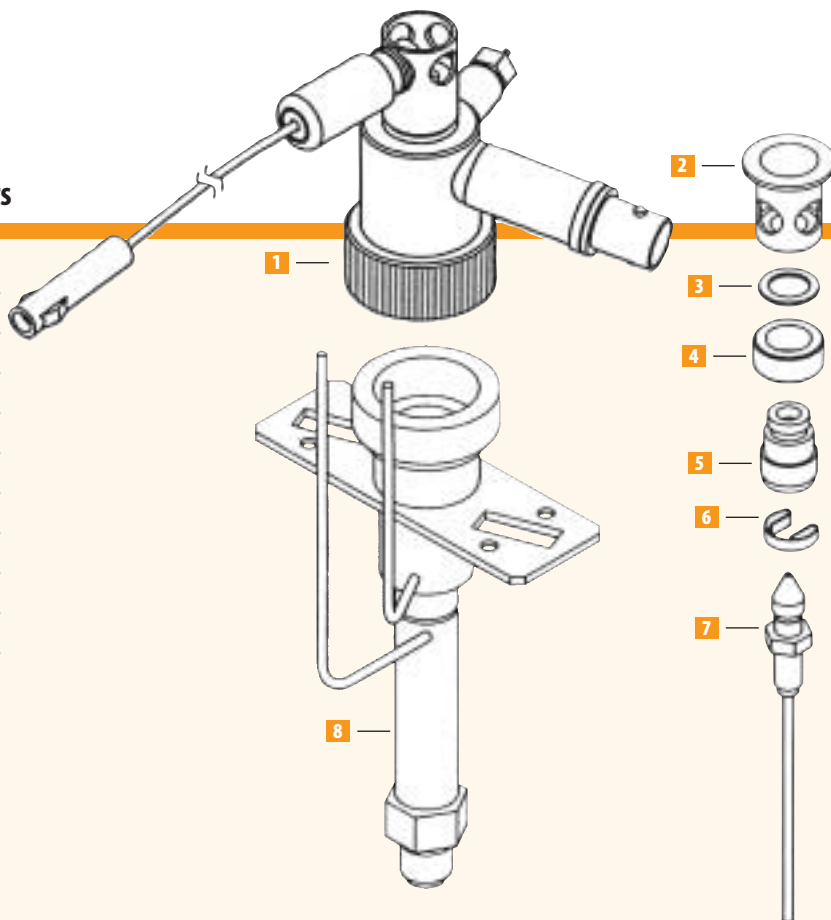
Part No. N6103151

Detector Cover (Brown Color)

Part No. N6103225

Auto-ignite FID Replacement Parts

Description	Part No.
1 Collector Head Assembly	N6100357
Silicone Rubber O-Ring (not shown)	09902143
2 Polarizer Nozzle	N6103167
3 Spring Washer	09907827
4 Nozzle Insulator	N6101085
5 Nozzle Collector	N6103175
6 FID Jet Contact/Spring	N6001204
7 Jet Assembly	N6100361
8 FID Body	N6100364



Detectors

Flame Ionization Detector (FID) for AutoSystem™ Series GCs

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External Igniter FID Add-on Kits

External Igniter FID without PPC Add-on Kit for AutoSystem Series GCs

Kit includes detector assembly with heater and sensor, heater block, igniter, hydrogen pressure regulator, and air needle valve. Requires but does not include FID amplifier board (N6120162).

Part No. N6120010 (120 V)

Part No. N6120024 (240 V)

External Igniter FID with PPC Add-on Kit for AutoSystem XL

Kit includes detector, heater and sensor, heater block, igniter, programmable pneumatics, and controls for detector combustion gases. Requires but does not include FID amplifier (N6120162). The AutoSystem XL must be PPC ready. If not, PPC upgrade kit (N6120146) is required. (See page GC-97 for more information.) Installation by PerkinElmer Service is required but not included.

Part No. N6120120 (120 V)

Part No. N6120121 (230 V)

FID Amplifier

Required for use with FID Detector Add-on Kit.

Part No. N6120162

Miscellaneous Accessories

Igniter Assembly

Complete replacement igniter assembly with glow plug.

Part No. N6100016

Replacement Glow Plug for External Ignite FID

Part No. 00091279

External Ignite Nozzle Replacement Tool

For removing nozzle from External Ignite FID body.

Part No. N6100102

Catalytic Reactor Accessory

The catalytic reactor converts CO and CO₂ to methane conveniently and efficiently. The lower detection limit is extended to well below 0.1 ppm.

The catalytic reactor consists of a special catalytic reactor base which replaces the FID base. The reactor body contains a quantity of catalyst held in place by a quartz wool plug.

Kits include base assembly, reactor tube, and instructions.

AutoSystem Series GC External Igniter FID Catalytic Reactor Accessory

Part No. N6120070

AutoSystem XL GC Auto-ignite FID Catalytic Reactor Accessory

Part No. N6120161

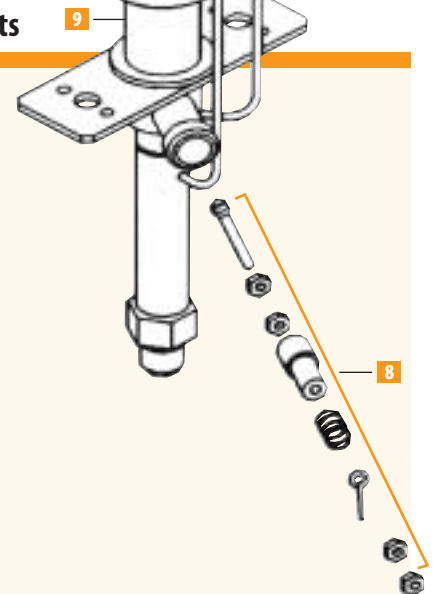
AutoSystem Catalytic Reactor Replacement Parts

Description	Part No.
Jet Assembly	N6100194
Quartz Wool	N6102354
Catalyst	N9302698



External Igniter FID Replacement Parts

Description	Part No.
1 Collector Head Assembly	N6100170
2 Collector Cap	N6101037
3 Nozzle Insulator	N6101085
4 Nozzle Ring	09912223
5 FID Nozzle	N6101100
6 FID Jet Contact	N6001204
7 Jet Assembly	N6100038
8 Polarizer Replacement Kit	N9300089
9 FID Body	N6100037
Collector Adapter, Teflon®* (not shown)	N6101547



*Note: If instrument was purchased prior to March 1993, the following items must also be ordered: one each of N6101546 and 09912223.

Flame Ionization Detector (FID) for 8000/Sigma 2000 Series GCs

FID Add-on Kits for 8000 Series

Complete FID Assembly

Includes detector, heated module, igniter, and all necessary parts to add FID. Requires but does not include amplifier.

Part No. N6621052 (120 V)

Part No. L4191050 (240 V)

Amplifier For Single FID or NPD

Kit includes amplifier board and all parts necessary to add an independent FID channel. Fits models 8400, 8500, and 8700 only.

Part No. N6621084

FID Accessories for 8000 Series GCs

FID Igniter Assembly

Complete assembly for 8400, 8500, and 8700 instruments.

Part No. L4135067

FID Igniter Assembly

Complete assembly for 8300 instruments only.

Part No. L4830417

Element, FID Igniter

Replacement element fits any 8000 Series GC.

Part No. 04971733

Catalytic Reactor Accessory

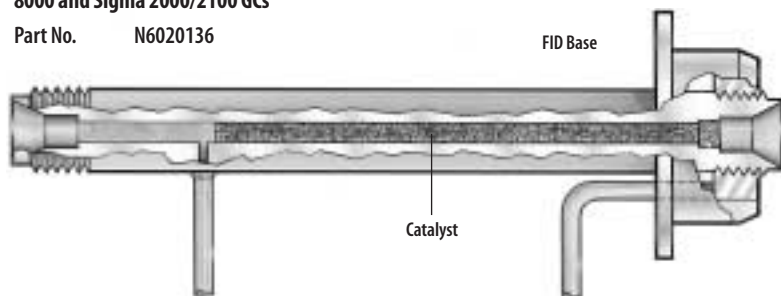
The catalytic reactor converts CO and CO₂ to methane conveniently and efficiently. The lower detection limit is extended to well below 0.1 ppm.

The catalytic reactor consists of a special catalytic reactor base which replaces the FID base. The reactor body contains a quantity of catalyst held in place by a quartz wool plug.

Kits include base assembly, reactor tube, and instructions.

8000 and Sigma 2000/2100 GCs

Part No. N6020136



FID Accessories for Sigma 2000/2100 GCs

FID Igniter Assembly

For Sigma 2000/2100 Series only. Complete igniter assembly.

Part No. N6000168

Replacement Glow Plug

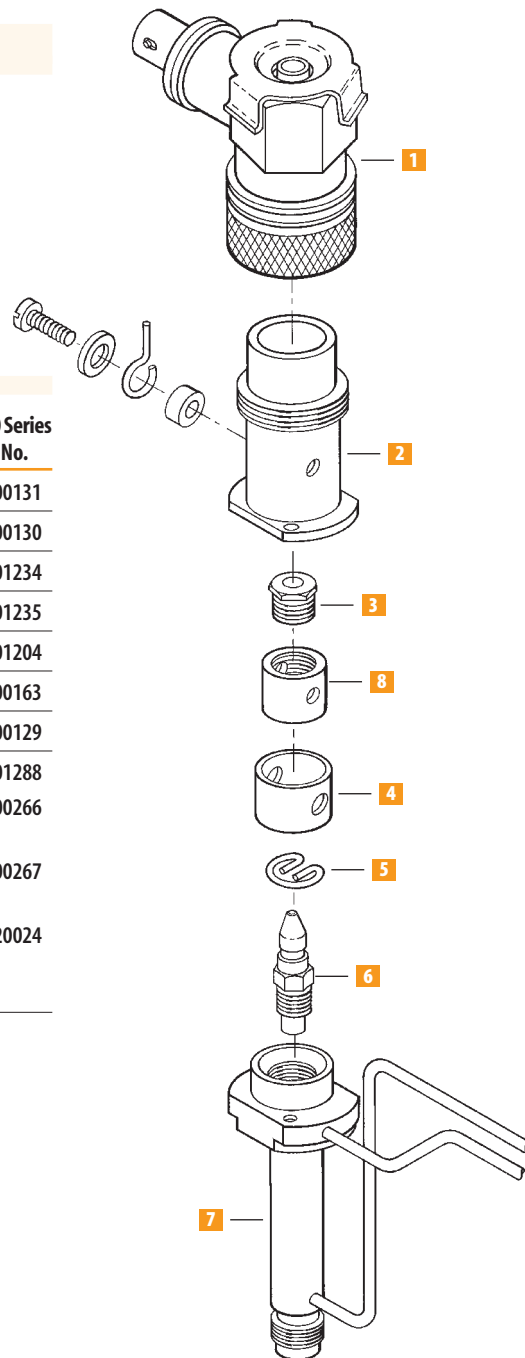
Part No. 00091279

FID Replacement Parts

Description	8000 Series Part No.	2000 Series Part No.
1 Collector Assembly	L4135004	N6000131
2 FID Body	L4131004	N6000130
3 Nozzle	N6001234	N6001234
4 Nozzle Insulator	N6001235	N6001235
5 Jet Contact Spring	N6001204	N6001204
6 FID Jet	N6000163	N6000163
7 FID Base	L4135001	N6000129
8 Housing Nozzle	N6001288	N6001288
Receiver 1/8 in.* (not shown)	N6000266	N6000266
Receiver 1/4 in.* (not shown)	N6000267	N6000267
Receiver for 0.53 mm Columns 1/16 in.** (not shown)	N6020024	N6020024

* Glass-lined.

** Glass-lined for use with wide-bore capillary columns.



Thermal Conductivity Detector (TCD) for AutoSystem™ Series GCs

1.800.762.4000 US

- Lower Internal Volume and Smaller Overall Size
- No Makeup Gas Required with 0.53 mm and 0.32 mm i.d. Capillary Columns
- Series Connection Option
- Excellent Sensitivity Over a Wide Dynamic Range

The AutoSystem TCD is a universal detector responding to most compounds, as well as gases such as oxygen, nitrogen, and carbon dioxide. Easy to use with a wide dynamic range, the TCD allows excellent detection at both high concentrations and low ppm ranges.

The TCD is mounted in an insulated, heated module for easy installation and removal. The detector cell consists of sample and reference channels, each comprising a pair of tungsten rhenium filaments connected in a Wheatstone bridge arrangement.

How it Works

Balanced carrier flow is maintained through the analytical and reference channels. The filaments are electrically heated and assume a temperature dependent upon the thermal conductivity of the gas passing over them. When column effluent of a different thermal conductivity passes through the analytical or reference channel, the bridge circuit becomes unbalanced and gives rise to a signal that yields the chromatographic output.

Complete Add-on Kits

TCD Add-on Kit for AutoSystem Series GCs

Kit includes all necessary items to install the TCD into the instrument: detector, heater, sensor, heater block, 1/16 in. gas line, and flow controller pneumatics. Requires but does not include amplifier (N6120015). The TCD can only be installed in the rear detector position.

Part No. N6120012 (120 V)

Part No. N6120027 (240 V)

TCD with PPC™ Add-on Kit for AutoSystem XL GCs

Kit includes detector, heater, sensor, heater block and programmable pneumatic control for reference gas. Requires but does not include amplifier (N6120015).

The TCD can only be installed in the rear detector position. The AutoSystem XL must be PPC ready. If not, PPC upgrade kit (N6120146) is required.

(See page GC-97 for more information.) Installation by PerkinElmer Service is required but not included.

Part No. N6120124 (120 V)

Part No. N6120125 (230 V)

TCD Amplifier

Part No. N6120015

TCD 1/8 in. PPC Makeup Kit

Includes parts required to add PPC controlled makeup gas to an existing TCD. Includes tubing, tee-piece, PPC pneumatics module, and PPC frit #4 (N6120155).

Requires PPC capability in AutoSystem XL.

Part No. N6120150

Column Adapters

1/8 in. to 1/16 in.

Column adapter for use with capillary columns.

Part No. N6120020

1/8 in. to 1/4 in.

Column adapter for use with 1/4 in. packed columns.

Part No. 00080100

TCD/FID Series Operation Kit

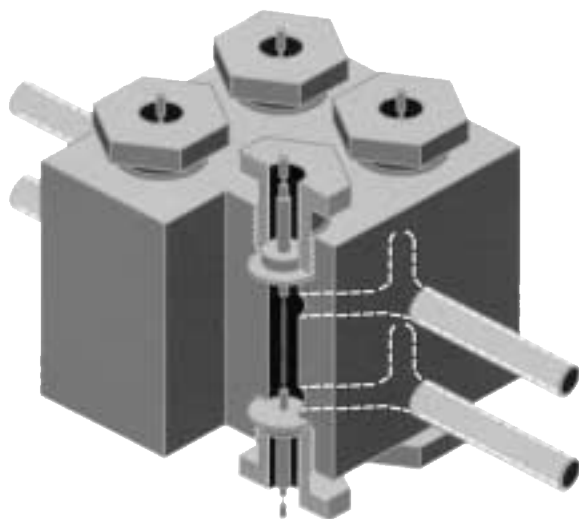
TCD and FID series operation kit for directing effluent from a TCD to an FID.

Part No. N6120006

Detector Makeup Gas Kit without PPC

For use with TCD (at low flow rates). Required when using 0.25 mm i.d. and recommended when using 0.32 mm i.d. capillary columns. Kit includes 1 m of 1/16 in. tubing to connect to gas supply, graphite/vespel ferrules, manual pneumatics, and installation instructions.

Part No. N6120080



Thermal Conductivity Detector

The AutoSystem™ ECD is a versatile, nondestructive detector which responds strongly to halogen-containing compounds as well as to certain other electron-capturing substances. The ECD's high sensitivity and selectivity make it an ideal choice for pesticide residue analysis and for detection of halogen-derivatized compounds.

The AutoSystem ECD has an independent temperature range of 100–450° C. The detector contains thermal protection that prevents heating the Ni⁶³ source to temperatures beyond safe operating limits. Two ECDs can be installed and operated simultaneously on the AutoSystem. Nitrogen or argon/methane is the required detector operating gas. The base of the detector terminates in a 1/8 in. fitting.

Complete ECD Add-on Kit

ECD Add-on Kit for AutoSystem Series

Kit includes all parts necessary to install an ECD on the AutoSystem GC. Includes detector, heater, sensor, heater block, 1/16 in. makeup gas line, makeup gas needle valve, and vent tube assembly. Requires but does not include ECD amplifier (N6120014).

Part No. N6120011 (120 V)

Part No. N6120026 (240 V)

ECD with PPC Add-on Kit for AutoSystem XL GC

Kit includes detector, heater, sensor, heater block, and programmable pneumatic control for makeup gas. Requires but does not include ECD amplifier (N6120014). The AutoSystem XL GC must be PPC™ ready. If not, PPC upgrade kit (N6120146) is required. (See page GC-97 for more information.) Installation by PerkinElmer Service is required but not included.

Part No. N6120122 (120 V)

Part No. N6120123 (230 V)

ECD Amplifier

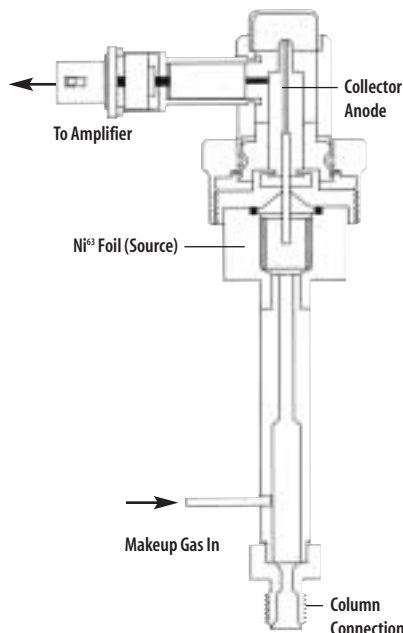
Required for use with ECD detector with add-on kit.

Part No. N6120014

Vent Tube Assembly

Flexible tube to safely vent toxic sample effluent.

Part No. N6100161



Column Adapters for AutoSystem/ AutoSystem XL GCs

1/4 in. Packed Column Adapter

For use with 1/4 in. packed columns. 1/8 in. to 1/4 in. adapters fit both injector and detector ends.

Part No. 00080100

Capillary Column Adapter/Receiver

Adapter converts 1/8 in. fitting to 1/16 in. for use with capillary columns. **Note:** Glass-lined tubing reduces background from polyimide coating in high temperature applications.

Part No. N6000968

PID/ECD Series Operation Kit

Kit for directing effluent from PID to ECD.

Part No. N6120059

Wipe Test Kit

U.S. Federal law requires that all ECDs be wipe-tested periodically as described in the instrument operator's manual. In the U.S., possession and use of ECD is regulated by N.R.C. and/or state regulatory agencies. Licensing by regulatory agencies is required. Outside of the U.S. check with governing bodies for licensing and regulations covering possession and use. This kit contains everything necessary to do a complete wipe test. For use on any model GC ECD.

Part No. 00091667

8000 Series ECD Accessories

8000 Anode Assembly

Complete anode assembly.

Part No. N6000729

8000 Anode

Part No. N6000507

8000 Series ECD Amplifier

For all 8000 Series GCs.

Part No. N6620087

8000 Series Detector Receivers

1/8 in. Receiver

1/8 in. receiver for use with 1/8 in. packed columns.

Part No. N6000266

1/4 in. Receiver

1/4 in. receiver for use with 1/4 in. packed columns.

Part No. N6000267

1/16 in. Adapter/Receiver

Adapter converts 1/8 in. fitting to 1/16 in. for use with capillary columns.

Part No. N6000968

Sigma 2000 ECD Accessories

Anode Assembly

Complete anode assembly.

Part No. N6000729

ECD Anode

Part No. N6000507

Sigma 2000 ECD Amplifier

Part No. N6021400

Sigma 2000 Detector Receivers

1/8 in. Receiver

1/8 in. receiver for use with 1/8 in. packed columns.

Part No. N6000266

1/4 in. Receiver

1/4 in. receiver for use with 1/4 in. packed columns.

Part No. N6000267

1/16 in. Receiver

1/16 in. receiver for use with capillary columns.

Part No. N6000968

Nitrogen Phosphorus Detector (NPD) for AutoSystem™ Series GCs

- Easy Bead Installation
- One Hour Conditioning Time
- Increased Stability

The AutoSystem™ NPD design offers quick and easy bead installation. You can be up and running within two hours! The NPD design incorporates a new cesium glass material as the ionization source. Heating the glass using closed-loop, AC control produces increased stability and results in improved detectability.

The NPD mounts in the detector position at the top of the AutoSystem oven where one or two NPDs can be simultaneously operated and independently temperature-controlled.

The base of the NPD terminates in a 1/8 in. fitting for easy capillary or packed-column connections. 1/4 in. columns can be installed using an adapter.

The NPD can be used for the analysis of organic compounds containing nitrogen or phosphorus down to the picogram level. The NPD has become the detector of choice for low-level drug and pesticide applications because of its sensitivity and selectivity.

Complete NPD Add-on Kits

NPD Add-on Kit for AutoSystem Series

Kit includes detector, heater, sensor, heater block, air needle valve, and hydrogen pressure regulator with snubber and two beads. Requires but does not include amplifier. AutoSystem Firmware revision 1.4 or greater is required. Firmware must be PerkinElmer Service installed. AutoSystem operator's manual (09938559) revision D or greater is required.

Part No. N6120090 (120 V)

Part No. N6120091 (240 V)

NPD with PPC Add-on Kit for AutoSystem XL GC

Kit includes detector, heater, sensor, heater block, and programmable pneumatic control for detector combustion gases and two beads. Requires but does not include amplifier (N6120094). The AutoSystem XL GC must be PPC™ ready. If not, the PPC upgrade kit (N6120146) is required. (See page GC-97 for more information.) Installation by PerkinElmer Service is required but not included.

Part No. N6120126 (120 V)

Part No. N6120127 (240 V)

AutoSystem NPD Amplifier

Required for use with NPD detector add-on kit.

Part No. N6120094

NPD Column Adapter

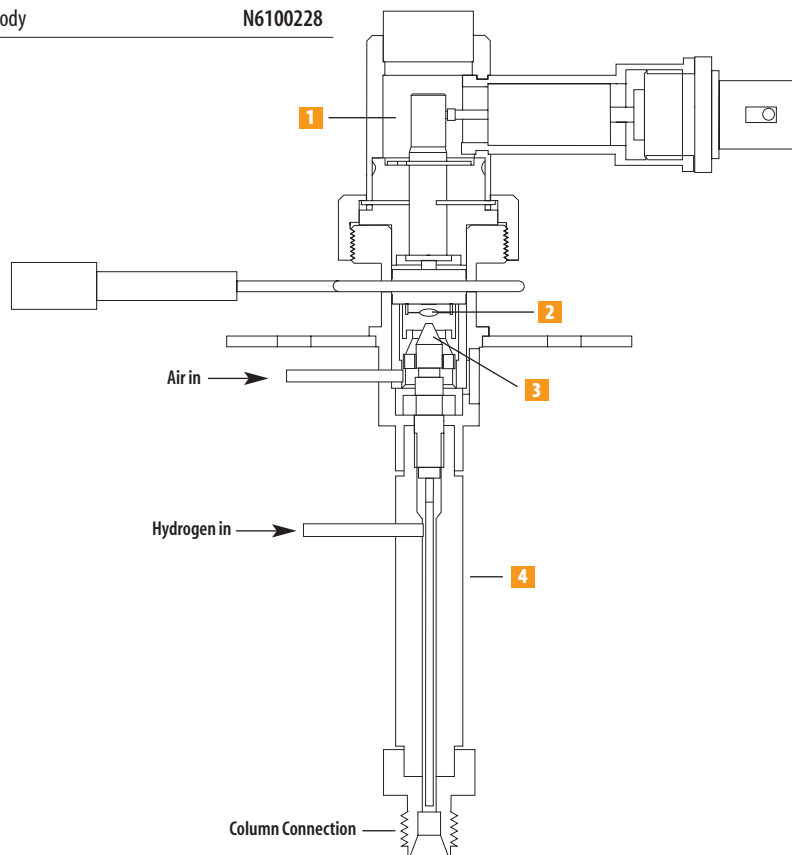
1/4 in. Packed Column Adapter

1/8 in. to 1/4 in. detector receiver adapter for use with 1/4 in. packed columns. Two required (injector/detector).

Part No. 00080100

NPD Replacement Parts

Description	Part No.
1 Collector Head	N6100253
2 Bead Assembly (pkg. 5) Single pkg.	N6120093 N6120092
3 Jet Assembly	N6100038
4 NPD Body	N6100228



Nitrogen Phosphorus Detector (NPD) for 8000/Sigma 2000 Series GCs

How it Works

The NPD is usually operated in the NP mode in which it is sensitive to both nitrogen and phosphorus. In the NP mode, partial combustion in a hydrogen plasma produces stable intermediates, which capture electrons from an electrically heated rubidium glass bead, resulting in the formation of ions.

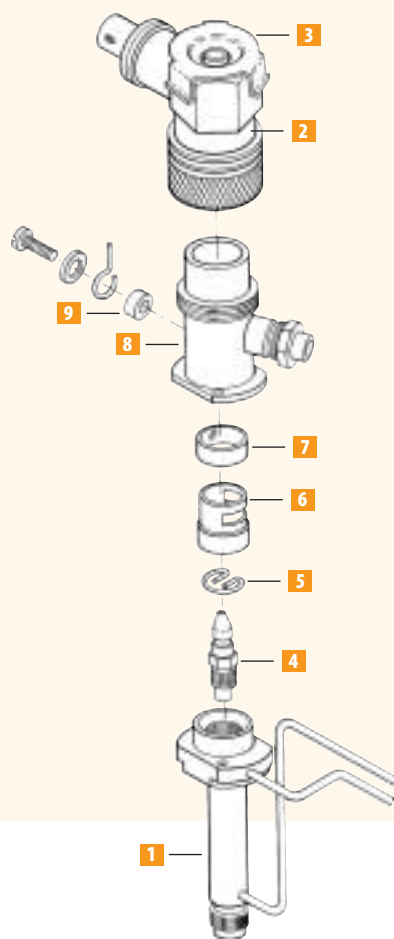
Under the influence of a polarizing field, these ions migrate to a collecting electrode and create a current, which is translated into the specific chromatographic peak. In the 8000 and 2000 Series GCs, the microprocessor-controlled adjustments to bead current ensure superb results.

8000 Series NPD Replacement Parts

Description	Part No.
1 Detector Base	L4135001
2 Collector Assembly	L4135004
3 Cap	L4830406
4 Jet	N6000163
5 Jet Contact Spring	N6001204
6 NPD Polarizer	N/A
7 Polarizer Insulator	N6001476
8 NPD Body	N/A
9 Insulator	N6001289

Sigma 2000 NPD Replacement Parts

Description	Part No.
1 Detector Base	N6000129
2 Collector Assembly	N6000131
4 Jet	N6000163
5 Jet Contact Spring	N6001204
6 NPD Polarizer	N6001558
7 Polarizer Insulator	N6001476
9 Insulator	N6001289



NPD Replacement Beads

Rubidium Bead

Replacement rubidium bead for 8000 Series and Sigma 2000 Series GC. (Left in photo below.)

Part No. N6600044

8000 New Style Replacement NPD Bead

8000 Series new style NPD bead. For use with 8000 Series GCs which have been replaced with the new style NPD (Feb. '92). This bead is NOT compatible with original NPD version. (Right in photo below.)

Part No. L4135478



Detector Receivers for 8000/2000 GCs

1/8 in. Detector Receiver

Part No. N6000266

1/4 in. Detector Receiver

Part No. N6000267

Adapter for 0.53 mm Capillary Columns

Part No. N6020024



Detectors

GC-38

Electrolytic Conductivity Detector (ELCD) Model 1000/2000 for AutoSystem™ Series GCs

1.800.762.4000 US

Excellent sensitivity and selectivity have made the electrolytic conductivity detector (ELCD) the detector of choice for several of the United States Environmental Protection Agency (USEPA) methods. The ELCD is specified in the analysis of purgeable halogenated compounds found in drinking water (EPA 502.1, 502.2), wastewater (EPA 601), and solid waste (EPA 8010).

The ELCD mounts on top of the AutoSystem in the detector 2 position, and terminates in a 1/16 in. fitting. If packed column operation is required, then the included detector adapter, which allows either 1/4 in. or 1/8 in. packed column use, should be installed. A detector makeup kit is required for operation at column flows under 10 mL/min.

Complete ELCD Add-on Kit

Kit includes detector, control module, heater, sensor, reaction gas pressure regulator, and all mounting hardware required for installation on an AutoSystem Series. Requires but does not include amplifier (N6120060). **Note:** Can only be installed in Channel 2 position. Firmware Revision 1.2 or greater is required. Firmware must be PerkinElmer Service installed. AutoSystem operator's manual (09938559) is required if not revision C or higher.

Part No. N6120046 (120 V)

ELCD Accessories for AutoSystem Series

ELCD Amplifier

Required for use with ELCD detector add-on kit.

Part No. N6120060

Detector Maintenance Kit

Kit includes label (1), 1/16 in. male nut (1), Teflon® tubing (21 in.), 1/16 in. vespel ferrule (2), 1/16 in. vespel sealing ring (1), reaction tube pks. (3 pkgs. of 2/pkg.).

Part No. N6601078

Solvent Reservoir Bottle

Replacement ion exchange resin tube, bottle for Model 1000. Electrolyte (N-propanol) NOT included.

Part No. N6601077

Resin Cartridge for Model 2000

Part No. N6102360

Solvent Bottle for Model 2000

Part No. N6102359

Detector Makeup Gas Kit

For use with ELCD (at low flow rates). Required when using 0.25 mm i.d., and recommended when using 0.32 mm i.d. capillary columns. Kit includes 1 m of 1/16 in. tubing to connect to gas supply, graphite/vespel ferrules, pneumatics, and installation instructions.

Part No. N6120081

ELCD 1/4 in. PPC Makeup Kit

Includes parts to add PPC™ controlled makeup gas to an existing ELCD. Includes tubing, tee-piece, PPC pneumatics module and PPC frit #3 (N6120154). Requires PPC capability in AutoSystem XL.

Part No. N6120151

AutoSystem PID/ELCD Detector Kit

The PID/ELCD are in the rear detector position. The PID/ELCD are operated independently in this configuration, but share a detector base which is controlled by the PID temperature setting. This allows use in series as well as individually. Kit includes ELCD and PID detectors, ELCD control module, dual detector heater block, heater, sensor, ELCD reaction gas pressure regulator, PID makeup gas needle valve, and mounting hardware required for installation on an AutoSystem. Requires but does not include PID amplifier and lamp power supply. **Note:** Can only be installed in Channel 2 position. AutoSystem control of ELCD attenuation, autozero, and software filtering requires ELCD amplifier.

PID/ELCD Detector Kit

Part No. N6120048 (120 V)

Part No. N6120058 (240 V)

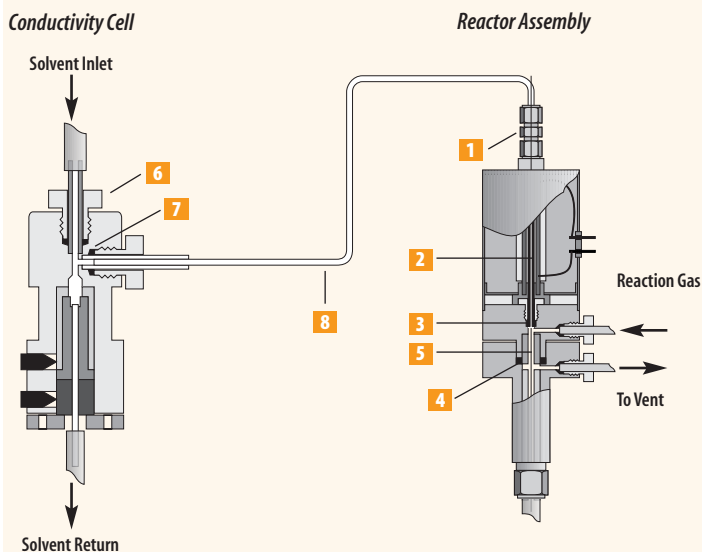
PID Amplifier

Part No. N6120061

PID Lamp Power Supply

Part No. N6120062

AutoSystem ELCD (Model 1000) Replacement Parts



Description	Model 1000 Part No.	Model 2000 Part No.
1 Modified Union (pkg. 1)	03302676	03302676
2 Nickel Reaction Tube (pkg. 2)	N6601072	N6102357
3 Detector Reaction Tube Sealing Ring Retaining Ring (pkg. 1)	N6601084	N6601084
4 Ferrule (pkg. 1)	N6601089	N/A
5 Quartz Insert (pkg. 1)	N6601088	N/A
6 Nut, Conductivity Cell (pkg. 1)	N6601287	N6601287
7 O-Ring for Nut Conductivity Cell (pkg. 1)	N6601082	N6601272
8 Teflon Transfer Line (30 cm) (pkg. 1)	N6601069	N6601069

ELCD Accessories

Solvent Reservoir Bottle

Replacement for Sigma and 8000 Series ELCD. Resin tube comes with solvent bottle and connecting tubing. Electrolyte (N-propanol) is NOT included.

Part No. N6601077

Charcoal Filter

Part No. N6600037

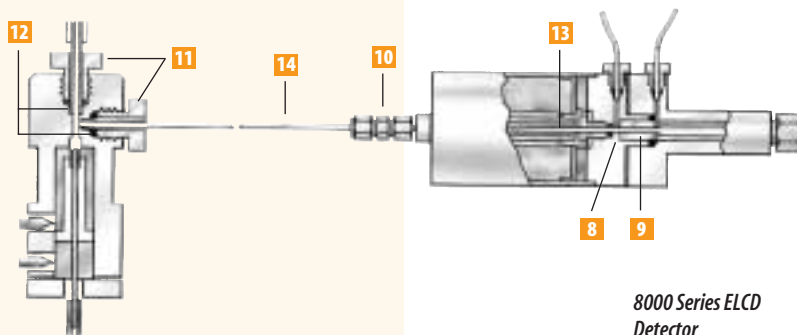
Detector Maintenance Kit

Kit includes Teflon® tubing (21 in.), 1/16 in. vespel ferrule (2), 1/16 in. vespel sealing ring (1), capture sleeve (1), 1/16 in. male nut (1), label, reaction tubes (3 pkgs. of 2/pkg.).

Part No. N6601078

8000 Series ELCD (Model 1000) Replacement Parts

Description	Part No.
8 Detector Reaction Tube Sealing Ring	N6601084
Seal Retainer	N6601085
9 Quartz Insert	N6601088
10 Modified Union	03302676
11 Nut, Conductivity Cell	N6601287
12 O-Ring for Nut Conductivity Cell	N6601082
13 Nickel Reaction Tube (pkg. 2)	N6601072
14 Teflon Transfer Line (30 cm)	N6601069



8000 Series ELCD
Detector



Detectors

GC-40

Flame Photometric Detector (FPD) for AutoSystem™ Series GCs

1.800.762.4000 US

The FPD is a highly sensitive and selective detector for both sulfur and phosphorus compounds. It is especially suitable for environmental monitoring of H₂S and sulfur gases in general and for organophosphorus compounds present at trace levels in pesticide analysis. Alkyl tin compounds can also be analyzed by changing the filter assembly. The sulfur filter is shipped standard.

The FPD mounts in either the front or rear detector position. This allows many detector combinations, such as FPD/FPD, FPD/TCD, and FPD/ELCD.

The AutoSystem also includes a linearizer function for the sulfur mode, and convenient control of the photomultiplier tube from the keyboard.

The FPD is capillary-column compatible. The detector will accept columns of 0.530 mm i.d. or less. The standard jet shipped with the FPD does not have a glass-lined tail pipe. If an all-glass system is required and glass packed columns will be used, then a glass-lined tail pipe should be ordered (N6100264). As a reminder, use of packed 1/4 in. columns requires a 1/8 in. to 1/4 in. adapter.

Complete Add-on Kits for AutoSystem Series GCs

FPD Add-on Kit for AutoSystem Series

Kit includes detector, heater, sensor, heater block, hydrogen needle valve, air pressure regulator, and sulfur photomultiplier filter. Requires but does not include FPD amplifier (N6120095). Firmware revision 1.6 or greater required. Firmware must be PerkinElmer Service installed. AutoSystem operator's manual (09938559) revision E or higher required.

Part No. N6120088 (120 V)

Part No. N6120089 (240 V)

FPD with PPC™ Add-on Kit for AutoSystem XL GC

Kit includes detector, heater, sensor, heater block, programmable pneumatic control for detector combustion gases, and sulfur photomultiplier filter. Requires but does not include FPD amplifier (N6120095). AutoSystem XL GC must be PPC ready. If not, PPC upgrade kit (N6120146) is required. (See page GC-97 for more information.) Installation by PerkinElmer Service is required but not included.

Part No. N6120128 (120 V)

Part No. N6120129 (230 V)

FPD Amplifier

Firmware revision 1.6 or greater required. Firmware must be PerkinElmer Service installed. AutoSystem operator's manual (09938559) revision E or higher required.

Part No. N6120095

Packed Column Adapter

1/8 in. to 1/4 in. adapter for use with 1/4 in. packed columns.

Part No. 00080100

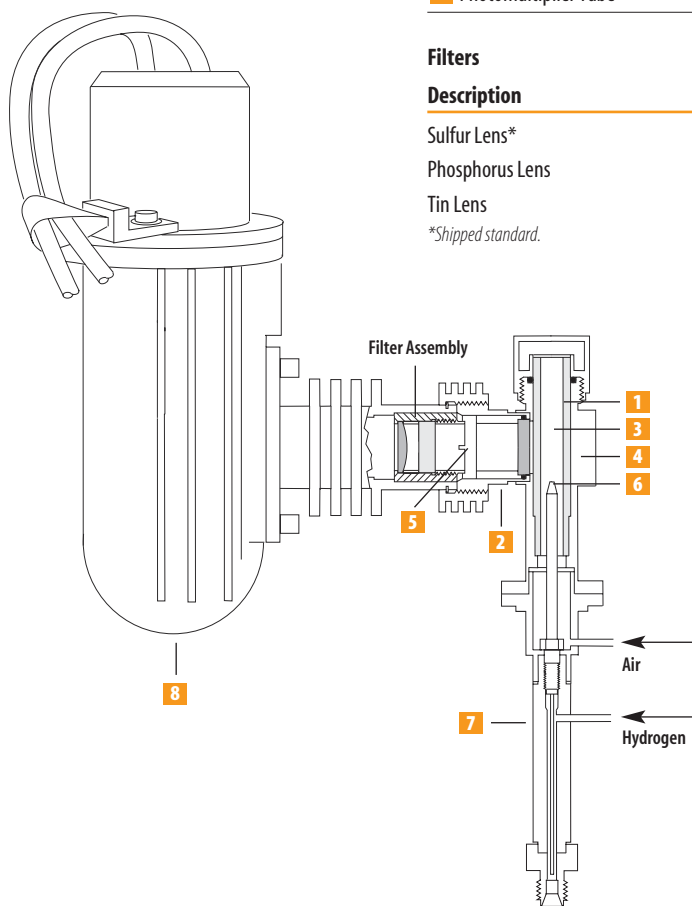
FPD Replacement Parts for AutoSystem Series GCs

Description	Part No.
1 O-Ring	09902247
2 Seal Assembly and Window (heat shield)	N9300096
3 Liner (window)	N6003057
4 FPD Body (upper)	N6100243
5 Window Holder	N6003066
6 FPD Jet Glass-lined Jet Tailpipe (for all-glass system)	N6100245 N6100264
7 FPD Body (lower)	N6100244
8 Photomultiplier Tube	09972321

Filters

Description	Part No.
Sulfur Lens*	N6000637
Phosphorus Lens	N6000981
Tin Lens	L4135472

*Shipped standard.



Flame Photometric Detector (FPD) for 8000/Sigma 2000 Series GCs

Miscellaneous Accessories

Photomultiplier Tube

Replacement photomultiplier tube for 8000 and Sigma 2000 Series FPDs.

Part No. 09972321

Column Receiver

1/8 in. column receiver for use with packed 1/8 in. columns.

Part No. N6000266

Column Receiver

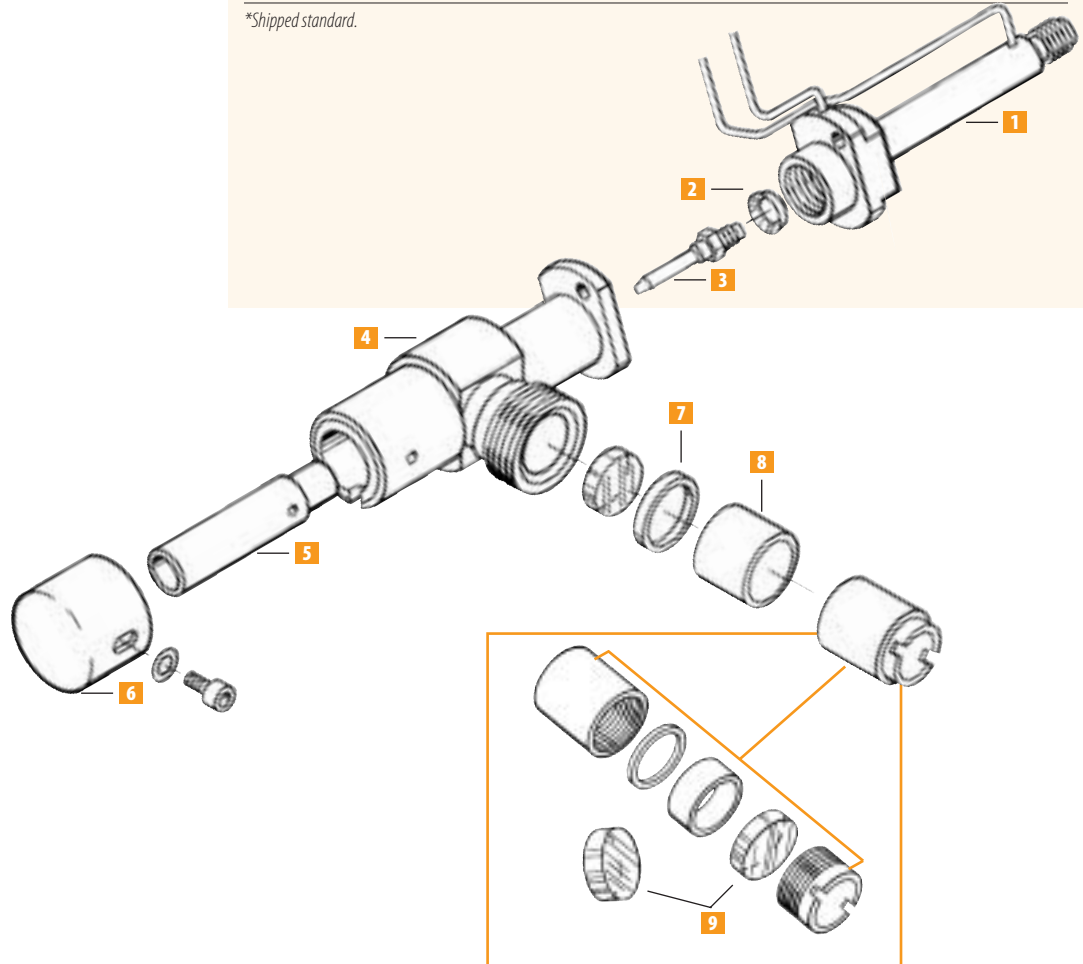
1/4 in. column receiver for use with 1/4 in. packed columns.

Part No. N6000267

FPD Replacement Parts for 8000/Sigma 2000 Series GCs

Description	8000 Series Part No.	2000 Series Part No.
1 FPD Base	L4135001	N6000129
2 Diffuser	N/A	N/A
3 FPD Jet	N6000635	N6000635
4 FPD Body	N/A	N6000634
5 Liner, Heat Shield	N6003057	N6003057
6 FPD Detector Cap	N/A	N/A
7 Seal	09907377	09907377
8 Window Holder	N6003066	N6003066
9 Sulfur Mode* Filter Assembly Phosphorus Mode Filter Assembly	N6000637 N6000981	N6000637 N6000981

*Shipped standard.



- *Universal or Selective*
- *Nondestructive*
- *Recommended for EPA Methods*

The AutoSystem™ PID is customarily used to detect aromatic and unsaturated compounds in drinking water, wastewater, and soil or sludge samples according to United States Environmental Protection Agency (USEPA) procedures.

The PID utilizes a high-intensity ultraviolet light source to ionize the sample components eluting from the column in order to generate the chromatographic signal. The PID has a maximum recommended operating temperature of 250° C. The lamp can be replaced with a blanking disk to allow bake-out operation (up to 350° C).

Complete PID Add-on Kit

PID Add-on Kit for AutoSystem Series

Kit includes detector, heater, sensor, makeup gas needle valve, and all necessary mounting hardware for installation on an AutoSystem GC. Requires but does not include amplifier (N6120061) and lamp power supply (N6120062). Firmware revision 1.2 or greater is required. Firmware must be PerkinElmer Service installed. AutoSystem operator's manual (09908559) is required if not revision C or higher.

Part No. N6120047 (120 V)

Part No. N6120057 (240 V)

PID with PPC™ Add-on Kit for AutoSystem XL GC

Kit includes detector, heater, sensor, heater block, and programmable pneumatic control for makeup gas. Requires but does not include amplifier (N6120061) and power supply (N6120062). The AutoSystem XL GC must be PPC ready. If not, PPC upgrade kit (N6120146) is required. (See page GC-97 for more information.) Installation by PerkinElmer Service is required by not included.

Part No. N6120130 (120 V)

Part No. N6120131 (230 V)

AutoSystem PID/ELCD Detector Kit

PID/ELCD Single-position Detector Add-on includes ELCD and PID complete detector assemblies. ELCD control module, dual-detector heater block, heater, sensor, ELCD reaction gas pressure regulator, PID makeup gas needle valve, and all mounting hardware required for installation on AutoSystem GC. (Note: Can only be installed in rear position.) Requires but does not include PID amplifier and lamp power supply. AutoSystem control of ELCD attenuation, autozero, and software filtering requires ELCD amplifier (see page GC-38).

Part No. N6120048 (120 V)

Part No. N6120058 (240 V)

PID Amplifier

Required for use with PID detector add-on kit.

Part No. N6120061

PID Lamp Power Supply

Required for use with PID detector add-on kit.

Part No. N6120062

Detector Series Operations Kits

PID/FID, PID/ECD

Series kit for directing effluent from a PID to an FID or an ECD.

Part No. N6120059

TCD/FID

Series kit for directing effluent from a TCD to an FID.

Part No. N6120006

PID Accessories

1/4 in. Detector Receiver

Part No. 03300866

1/8 in. Detector Receiver

Part No. 03300865

Lamp Cleaning Compound

Part No. 03302775

Bakeout Disk

Part No. 03302989

PID Replacement Lamps and Parts

1 PID Lamp (10.2eV)

For most applications including aromatics, alkenes, and aliphatics higher than C4. Shipped standard with PID.

Part No. 03303599

PID Lamp (9.5eV)

Improved selectivity for multiple ring aromatic, sulphur compounds.

Part No. 03303598

2 PID Lamp Window Seal

Part No. 03302778

3 PID Lower Lamp Seal

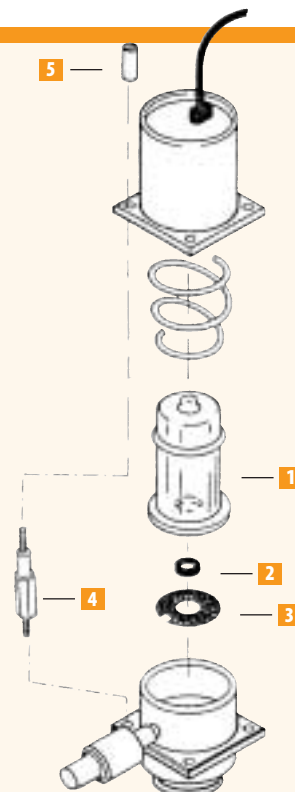
Part No. 03302777

4 Shoulder Pin

Part No. 03302976

5 Cap Nut

Part No. 03303773



TotalChrom™ Chromatography

1.800.561.4646 Canada

Data Handling Systems

GC-43

www.perkinelmer.com/essentials

PerkinElmer's TotalChrom Chromatography Data System is designed to provide laboratories with the total answer to chromatography data handling needs. TotalChrom is an improved and enhanced version of the software previously marketed as Turbochrom™.

When configured with a PerkinElmer AutoSystem™ XL Gas Chromatograph or a PerkinElmer Series 200 Liquid Chromatograph, the TotalChrom Workstation (TCWS) Data System is the controller and data manager for the overall system. TotalChrom Workstation systems can also control selected instruments from other vendors and can acquire data from any chromatographic system.

The TotalChrom Client/Server (TC C/S) Data System provides the same features as the Workstation system in a multiuser environment. TC C/S systems can easily integrate all existing chromatographs into a single networked system supporting an unlimited number of users and an unlimited number of chromatographs. Coupled with the new Oracle-based TC Database, which offers file storage and query capability, TotalChrom C/S is a complete data system to handle all laboratory needs.

New features of TotalChrom 6.2 include TCPublisher®, the most powerful chromatography reporting tool available, and additional features to aid in compliance with 21 CFR Part 11 regulations. TCPublisher allows automatic generation of an endless variety of reports. TCPublisher supports single injection reports, dual column reports, and summary reports. Default reports, are supplied as examples and a sophisticated layout tool is provided to modify existing report designs or to design new ones. Reports easily integrate text, data, and graphics. Separate text tables can be used for each different sample type and each table can select independent peaks, data, and calculations.



TotalChrom Navigator Screen



TCPublisher Replicate Injections Report



TCPublisher Dual Channel Report



TCPublisher Single Injection Report



Software

TotalChrom Workstation Software

TotalChrom Workstation Single-instrument Software Kit

Part No. N5150101

TotalChrom Workstation Dual-instrument Software Kit

Part No. N5150102

TotalChrom Workstation Multi-instrument Software Kit*

Part No. N5150103

TotalChrom Workstation Reprocess Only Software Kit*

Part No. N5150100

TotalChrom Workstation Manuals

TotalChrom Workstation Manual Set

Complete manual set including User's Guide (volumes 1 and 2), Application Manager's Guide, and Tutorial.

Part No. N5150512

TotalChrom Workstation User's Guide (Volumes 1 and 2)

User's manual covering instrument configuration and basic operation of TotalChrom Workstation software.

Part No. N5150518

TotalChrom Workstation Application Manager's Guide

Application Manager's Guide covering installation and system management of TotalChrom Workstation software.

Part No. N5156025

TotalChrom Tutorial

Software tutorial that teaches basic data acquisition, method development, optimization techniques, sequence development, and calibration.

Part No. N5156021

TotalChrom Workstation IQ/OQ Manual

Includes TotalChrom IQ/OQ documentation set. Set includes both hard copy and electronic documentation. Consult with your local service administrator for availability of additional services such as IQ/OQ installation.

Part No. N5150519

TotalChrom Workstation SI/DI Upgrade Kits

TotalChrom Workstation Single-instrument to Dual-instrument Upgrade Kit*

Upgrades existing TotalChrom Workstation Single-instrument System to Dual-instrument System capability. Also compatible with Turbochrom™ Workstation v.6 data systems.

Part No. N5150112

TotalChrom Workstation Single-instrument to Multi-instrument Upgrade Kit*

Upgrades existing TotalChrom Workstation Single-instrument System to Multi-instrument System capability. Also includes one Reprocess Only license. Also compatible with Turbochrom Workstation v.6 data systems.

Part No. N5150113

TotalChrom Workstation Dual-instrument to Multi-instrument Upgrade Kit

Upgrades existing TotalChrom Dual-instrument Software to Multi-instrument version. Also includes one Reprocess Only license. Also compatible with Turbochrom Workstation v.6 data systems.

Part No. N5150114

**If no IEEE-488 board (Part No. S2700402), NCI, or terminal server exists in the current system configuration, it will be necessary to purchase one or more of these parts for additional instrument connectivity.*

TotalChrom Optional Software

System Suitability Software for TotalChrom and Turbochrom Workstation Software

Part No. N5150180

CONNECT for TotalChrom and Turbochrom Workstation Software

Part No. N5150182

Size Exclusion Software (TurboSEC) for TotalChrom and Turbochrom Software

Part No. N5150183

Turbochrom Version Upgrades to TotalChrom Workstation Software

Turbochrom Professional v.4.x Single-instrument Migration to TotalChrom Workstation Single Instrument Software

Part No. N5150341

Turbochrom Professional v.4.x Dual-instrument Migration to TotalChrom Workstation Dual Instrument Software

Part No. N5150342

Turbochrom Professional v.4.x Multi-instrument Migration to TotalChrom Workstation Multi-instrument Software

Part No. N5150343

Turbochrom Professional v.4.x RPO Migration to TotalChrom Workstation RPO Software

Part No. N5150340

Turbochrom Workstation v.6.x to TotalChrom Workstation v.6.2 Software

Part No. N5150349

Agilent 5890A/5890 Series II GC and Agilent 7673 Autosampler Serial Communications Cards for Turbochrom

Agilent 5890A/Series II GC – Serial Card

Part No. S2000203

Agilent 7673A Controller – Serial Card and EPROM

Part No. S2000204

Agilent 7673A Controller – Serial Card and Control Board

Part No. S2000205

Agilent 7673A Controller – Remote Start Cable

Part No. S2000206

TotalChrom Turnkey GC

TotalChrom Turnkey consists of TotalChrom Workstation Single Instrument Software preinstalled on a Dell computer. It includes everything needed to control, acquire, report, and store data from a PerkinElmer AutoSystem (XL) Gas Chromatograph. For other instrumentation contact your local sales representative. The computer comes with network capability and memory expansion slots. It does not include a sound card. TotalChrom Workstation Single Instrument Software, System Suitability Software, IVM Software, and appropriate instrument IPM License PAKS will be preinstalled. Includes AutoSystem IPM, User's, and Application Manager's Guides, Tutorial, 610 LINK, serial cable, and appropriate instrument cables for connectivity. May require, but does not include, analog, BCD, Ready/Run, and Start/Stop cables.

Part No. N5150610 (120 V)

Part No. N5150611 (240 V)

(Requires, but does not include, three 240 V power cords.)



TotalChrom Turnkey 901

TotalChrom Turnkey consists of TotalChrom Workstation Single Instrument Software preinstalled on a Dell computer. This is a single-channel, analog detector solution that allows TotalChrom to acquire, report, and store any vendor's chromatographic data. The computer comes with network capability and memory expansion slots. It does not include a sound card. TotalChrom Workstation Single Instrument Software, System Suitability Software, and IVM Software will be preinstalled. Includes User's and Application Manager's Guides, Tutorial, NCI 901 A/D Intelligent Interface, and PC to NCI serial cable. May require, but does not include, analog, BCD, Ready/Run, and Start/Stop cables.

Part No. N5150614 (120 V)

Part No. N5150615 (240 V)

(Requires, but does not include, three 240 V power cords.)

TotalChrom Turnkey 902

TotalChrom Turnkey consists of TotalChrom Workstation Single Instrument Software preinstalled on a Dell computer. This is a dual-channel, analog detector solution that allows TotalChrom to acquire, report, and store any vendor's chromatographic data. The computer comes with network capability and memory expansion slots. It does not include a sound card. TotalChrom Workstation Single Instrument Software, System Suitability Software, and IVM Software will be preinstalled. Includes User's and Application Manager's Guides, Tutorials, NCI 902 A/D Intelligent Interface, and PC to NCI serial cable. May require, but does not include, analog, BCD, Ready/Run, and Start/Stop cables.

Part No. N5150616 (120 V)

Part No. N5150617 (240 V)

(Requires, but does not include, three 240 V power cords.)



All TotalChrom™ systems utilize PerkinElmer Intelligent Interfaces to connect each chromatography system to the data system PC. Each interface contains buffered RAM memory to maintain data collection in the event that the PC or PC network becomes inoperative during data acquisition. Data from instruments is never lost and chromatograph productivity is preserved.

Analog chromatographs connect to TotalChrom through NCI (Network Chromatography Interface) Series Intelligent Interfaces. The model NCI 901 is a single-channel device, while the model NCI 902 is a dual-channel device. Both interface models are capable of taking analog detector data (unipolar or bipolar) at sampling rates from 0.1 to 100 Hz.

Digital chromatographs connect to TotalChrom through the Model 600 Series LINK Intelligent Interfaces. Multiple instruments can be connected to each LINK interface via the four serial ports included on each interface. Each port is capable of receiving signals from two detectors per chromatograph. In addition to collecting digital detector data, LINK interfaces also provide instrument control capability.

For TotalChrom Workstation and TotalChrom C/S, Intelligent Interfaces may be connected to a PC via either IEEE-488 cabling, a PC com (serial) port, or a Terminal Server. Com Port and Terminal Servers utilize serial cabling.

Series 900A Interface Connector Clips

Spare kit of model 950A, 970A, and 941A Interface analog connector clips.

Part No. **S9000402**

Series 900 Interface Connector Clips

Spare kit of model 950, 960, 970, and 941 Interface analog connector clips.

Part No. **85090101**

NCI Series Interface Connector Clips

Spare kit of NCI 901/902 Interface connector clips.

Part No. **S9000405**

M600 Series LINK and NCI Series Interfaces

Model	Memory	Recommended Applications	Voltage	Part No.
Model 600 LINK	256 KB	1 to 2 Instruments	120	90060001
			240	S9000018
Model 610 LINK	1 MB	3 to 4 Instruments, Capillary Instruments, PerkinElmer Diode Array Detector	120	90061001
			240	S9000019
Integral LINK Add-on Kit (brown)	256 KB	AutoSystem™ GC AutoSystem XL GC	N/A	N6120066
Integral LINK Add-on Kit (white)	256 KB	AutoSystem GC AutoSystem XL GC	N/A	N6120180
NCI 901	256 KB	Single Inst./Single Detector GC, LC, IC, or CE use	120	S9000070
			240	S9000075*
NCI 902	256 KB	Single Inst./Dual Detector GC, LC, IC, or CE use	120	S9000090
			240	S9000095*

**Select appropriate power cord (No Charge) from list below. All 120 V interfaces include USA power cord. Canada, Japan, Taiwan, Puerto Rico, Bahamas, and most Latin American countries use 120 V interface version.*

Power Cords – 240 V (No Charge When Ordered with 240 V Interface)

Country	Part No.
UK, Cyprus, Nigeria, Zimbabwe, Singapore, Malaysia, Zambia	09991414
Australia, New Zealand	09991417
Europe, Saudi Arabia, Egypt, South Africa, India, Thailand, China	09991415
Denmark, Greenland	09991416
Switzerland, Liechtenstein	09991413



Interface Validation Modules (IVM)

Model 520 Interface Validation Module, 120 V

The Model 520 IVM is a calibrated analog peak pattern generator for use in testing/validating analog to digital converters such as the NCI 901/902 and the Series 900/900A Intelligent Interfaces. The module generates eight possible analog patterns at selectable voltage ranges of 0-.1, 0-1, 0-2, and 0-10 volts. Factory calibration is traceable to a NIST standard volt. Includes remote start/stop cable and analog signal cable for connection to PerkinElmer NCI/900/900A Series Intelligent Interfaces. Includes one-year return to Service Depot warranty.

Part No. S9000160 (120 V)

Part No. S9000165 (240 V)

TotalChrom Workstation Model 520 IVM Software

Allows user to test any NCI Series and M900A Series Intelligent Interfaces to validate interface operations (linearity, reproducibility, etc.). Contains special TotalChrom interface test methods and automated validation logs to maintain results of interface tests in software. Requires, but does not include, a Model 520 Interface Validation Module.

Part No. N5150181



IVM 520

Interface Personality Modules (IPM)

IPMs are instrument-specific software programs that interpret and translate instrument control and data acquisition parameters between TotalChrom and a specific digital instrument. IPMs are downloaded from the host PC (TotalChrom) by a configuration function to a specific serial port on a Model 600 LINK interface. Downloaded IPMs are stored in nonvolatile memory in the LINK interface. Each IPM can be configured to any port or ports on any LINK interface connected to the TotalChrom acquisition PC. Each TotalChrom system (except TotalChrom EL) can support up to a maximum of eight instruments connected via Model 900 Series, NCI Series, Interfaces, and/or Model 600 LINK Series interfaces.

IPM for AutoSystem™ Series GCs

Provides control for the PerkinElmer AutoSystem Series GCs and their associated liquid Autosampler, with simultaneous digital data acquisition from two inboard detectors. Utilizes one serial port on a Model 600 LINK Series interface and may be configured to any port or ports on any LINK interface or interfaces connected to a single TotalChrom acquisition system. For TotalChrom Professional users, v4.0 or higher is required but not included.

Part No. N5150160 for TCWS

IPM for HS40/HS40 XL Headspace Sampler

Provides control for the PerkinElmer HS40/ HS40 XL Automated Headspace sampler. Also includes an application program for calculating results from Multiple Headspace Extraction (MHE) experiments. This IPM may be configured across one or more Model 600 Series LINK interfaces on a single TotalChrom acquisition system. Control of an HS40/HS40 XL sampler requires IPM control of an associated PerkinElmer AutoSystem GC. Up to two AutoSystem GCs may be configured, each with an associated HS40/HS40 XL per LINK interface. If needed, order one AutoSystem IPM and one serial cable for each connected AutoSystem GC. Includes one ten-foot serial cable for the HS40/HS40 XL. Requires but does not include HS40/HS40 XL communications option and firmware version 1.3 or higher.

Part No. N5150161 for TCWS

IPM for Agilent 5890 Series II, and Agilent 5890A GCs

Provides control for the Agilent Series 5890 GCs and their associated liquid Autosamplers, with simultaneous digital data acquisition from two inboard detectors. Utilizes one serial port on a Model 600 LINK Series interface and a second port for each associated Autosampler that is to be controlled. This IPM may be configured to any port or ports on any LINK interface or interfaces connected to a single TotalChrom acquisition system. Requires one serial cable for each connected Agilent GC and one serial cable for each connected Autosampler. For TotalChrom Professional users, v4.0 or higher is required but not included. **Note:** Each Agilent 5890 and 7673 autosampler must have the appropriate Agilent serial external controller card(s) and remote start cable installed. See GC-58.

Part No. N5150165 for TCWS

IPM for Agilent 6890, Agilent 6890Plus

Provides control for the Agilent Series 6890 GCs and their associated liquid Autosampler, with simultaneous digital data acquisition from two inboard detectors. Utilizes one serial port on a Model 600 LINK Series. This IPM may be configured to any port or ports on any LINK interface or interfaces connected to a single TotalChrom acquisition system. It is recommended that no more than two Agilent 6890GCs be configured per LINK interface. Requires one serial cable for each connected Agilent GC. Control of the Agilent 6890/6890Plus is not available for TC Pro.

Part No. N5150166 for TCWS

IEEE Cables (All TC Versions)

Cable Length	Part No.
1 m	65105001
2 m	65105102
4 m	65105204
8 m	65105408

TotalChrom™ WS and C/S Serial Cables to Lantronix Terminal Server for M950/970 Interfaces

Cable Length	Part No.
7 ft.	S5010017
25 ft.	S5010018
50 ft.	S5010019
100 ft.	S5010020

TotalChrom WS and C/S Serial Cables to Lantronix Terminal Server for M941/M600 LINK Interfaces

Cable Length	Part No.
7 ft.	S5010021
25 ft.	S5010022
50 ft.	S5010023
100 ft.	S5010024

TotalChrom WS and C/S Serial Cables to Lantronix Terminal Server for NCI Interfaces

Cable Length	Part No.
7 ft.	S5010037
25 ft.	S5010038
50 ft.	S5010039
100 ft.	S5010040

TotalChrom WS and C/S Serial Cables to PC for M941A and M600/610 Link Interfaces

Cable Length	Part No.
7 ft.	S5010025
25 ft.	S5010030
50 ft.	S5010031
100 ft.	S5010032

TotalChrom WS and C/S Serial Cables to PC for NCI Interfaces

Cable Length	Part No.
7 ft.	S5010033
25 ft.	S5010034
50 ft.	S5010035
100 ft.	S5010036

Agilent 6890 – HS40/ATD400 Ready/Run Cables

Description	Part No.
Cable Kit, HS40/ATD400 to Agilent 6890 Cable	N6100410
Cable Kit, M950/970 Series Interface to Agilent 6890	N6100411

Serial Cables* for Instrument to M600 LINK Interface

Description	Part No.
PerkinElmer AutoSystem™ GC to M600/M610 LINK, 10 ft.	65609010
PerkinElmer AutoSystem GC to M600/M610 LINK, 25 ft.	65609025
Agilent 5890A/Series II GC to M600/M610 LINK, 10 ft.	65605810
Agilent 5890A/Series II GC to M600 LINK, 25 ft.	65605825
Agilent 6890 GC/-Agilent 6890Plus GC-Autosampler to M600/M610 LINK, 10 ft.	S5010015
Agilent 6890 GC/-Agilent 6890Plus GC-Autosampler to M600/M610 LINK, 25 ft.	S5010016
Agilent 1512A Autosampler Controller (on 5890GC) to M600/M610 LINK, 10 ft.	S5010015
Agilent 1512A Autosampler Controller (on 5890GC) to M600/M610 LINK, 25 ft.	S5010016
Agilent 7673A Autosampler Controller (on 5890GC) to M600/M610 LINK, 10 ft.	65607610
Agilent 7673A Autosampler Controller (on 5890GC) to M600/M610 LINK, 25 ft.	65607625
M900/960/970 Series Interface to M600/M610 LINK, 6 ft. (not for M941)	S5010013
NCI Series Interface to M600/M610 LINK, 6 ft.	S5010041

*Special serial cards, instrument communication kits, and IPM software may be required to complete interfacing of a LINK interface to a digital chromatograph. Please contact your local PerkinElmer Sales Representative for details.

M900 Series BCD Cables for Autosamplers

Description	Part No.
Agilent 7671* Autosampler	65400500
Agilent 7672* Autosampler	65400600
Agilent 7673A Autosampler (Includes Remote Start Cable)	65400700
Agilent 1090 Autosampler (Includes Remote Start Cable)	65400800
PerkinElmer HS100, HS101, ATD50, AS2000, AS8300	65204501
PerkinElmer AS8300 with 8600/8700 GC	65900805

*Autosampler must be equipped with BCD option.

Wide Selection of Bonded Phase Capillary Columns

PerkinElmer is pleased to offer you one of the widest selections of capillary columns available. We use only the finest quality of high-strength fused-silica in the manufacture of our columns. Each column is individually inspected and tested to guarantee you the highest performance and to maximize reproducibility.

Many factors influence the quality of a column. Fused-silica is considered to be the purest form of glass, with fewer metal oxides (Lewis acid sites) and hydrogen bonding (surface silanol) groups. The stationary phase is crosslinked (polymerized) and also bonded to the surface of the column to provide a high degree of stability, resulting in lower bleeding of the stationary phase at elevated temperatures. The superior inertness of the column means that acidic and basic compounds can be analyzed on the same column.

PerkinElmer Capillary Columns Fit All GCs

A robust column cage contains your capillary column for easy installation into any PerkinElmer GC, even multiple columns can be installed with ease. Our unique cage is 7.65 in. in diameter and completely surrounds the column, protecting it from damage. It provides full thermal immersion for uniform heating, guaranteeing the maximum benefit from your high-performance PerkinElmer GC oven.

Full Range of Phases and Lengths

The inherent efficiency (large number of theoretical plates) of capillary columns allows you to choose from a relatively few types of phases, compared to the many varieties of packed columns previously required. Perhaps more importantly, because capillary columns are more efficient, you will see superior resolution resulting in narrower, taller peaks that allow easier integration from your data system. Identification of small peaks is facilitated by a reduced baseline bleed and lower baseline noise. We provide columns in the most popular lengths of 5, 10, 12, 15, 25, 30, 50, 60, 75, 100, and 105 m depending upon the column i.d.

Blood Alcohol Analysis Columns for GC and High-speed Headspace Gas Chromatography

Now using the PerkinElmer Blood Alcohol columns, standard separations and automated separations of less than 1.5 minutes can be accomplished. Sample concentrations range from 0.01% to 0.05% with quantitative precision of <3% RSD. A full range of analytes with a choice of internal standards can be used – with excellent quantitative performance. Two columns may be used in parallel for confirmation of peak identity.

Blood Alcohol Columns for High-speed Headspace GC

Elite BAC-1 Alcohol Column

10 m x 0.18 mm x 1.0 μ m

Part No. N9316573

Elite BAC-2 Alcohol Column

10 m x 0.18 mm x 0.63 μ m

Part No. N9316574

Elite BAC-3 Alcohol Column

10 m x 0.18 mm x 0.30 μ m

Part No. N9316575

Standard Blood Alcohol GC Columns

Elite BAC-1

30 m x .32 mm x 1.8 μ m

Part No. N9316579

Elite BAC-1

30 m x .53 mm x 3 μ m

Part No. N9316578

Elite BAC-2

30 m x .32 mm x 1.2 μ m

Part No. N9316577

Elite BAC-2

30 m x .53 mm x 2 μ m

Part No. N9316576



Blood Alcohol Analysis Columns

High-speed Headspace GC

Column	Internal Standard		
	n-Propanol	t-Butanol	Acetonitrile
BAC-1 Alcohol column 10 m x 0.18 mm x 1.0 μ m	X		
BAC-2 Alcohol column 10 m x 0.18 mm x 0.63 μ m	X	X	X
BAC-3 Alcohol column 10 m x 0.18 mm x 0.30 μ m		X	X

Gas Chromatography Columns

PerkinElmer Elite Series Capillary Columns

1.800.762.4000 US

GC-50

Elite-1 Dimethylpolysiloxane

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (°C)	Part No.
0.05	10	0.05	-60 to 330/350	N9316056
0.05	10	0.20	-60 to 330/350	N9316057
0.10	10	0.10	-60 to 330/350	N9316058
0.10	20	0.40	-60 to 320/340	N9316061
0.18	10	0.18	-60 to 330/350	N9316001
0.18	10	0.40	-60 to 320/340	N9316002
0.18	20	0.18	-60 to 330/350	N9316003
0.18	20	0.40	-60 to 320/340	N9316004
0.18	40	0.40	-60 to 320/340	N9316005
0.20	12	0.33	-60 to 330/350	N9316062
0.20	25	0.33	-60 to 330/350	N9316063
0.20	50	0.33	-60 to 330/350	N9316064
0.25	15	0.10	-60 to 330/350	N9316006
0.25	15	0.25	-60 to 330/350	N9316007
0.25	15	1.00	-60 to 320/340	N9316008
0.25	30	0.10	-60 to 330/350	N9316009
0.25	30	0.25	-60 to 330/350	N9316010
0.25	30	1.00	-60 to 330/350	N9316011
0.25	60	0.10	-60 to 330/350	N9316012
0.25	60	0.25	-60 to 330/350	N9316013
0.25	60	1.00	-60 to 320/340	N9316014
0.25	100	0.50	-60 to 300/320	N9316015
0.32	15	0.10	-60 to 330/350	N9316016
0.32	15	0.25	-60 to 330/350	N9316017
0.32	15	1.00	-60 to 320/340	N9316018
0.32	15	3.00	-60 to 280/300	N9316019
0.32	15	5.00	-60 to 260/280	N9316020
0.32	25	0.52	-60 to 330/350	N9316021
0.32	30	0.10	-60 to 330/350	N9316022
0.32	30	0.25	-60 to 330/350	N9316023
0.32	30	1.00	-60 to 320/340	N9316024

Elite-1 Dimethylpolysiloxane

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (°C)	Part No.
0.32	30	3.00	-60 to 280/300	N9316025
0.32	30	5.00	-60 to 260/280	N9316026
0.32	60	0.10	-60 to 330/350	N9316027
0.32	60	0.25	-60 to 330/350	N9316028
0.32	60	1.00	-60 to 320/340	N9316029
0.32	60	3.00	-60 to 280/300	N9316030
0.32	60	5.00	-60 to 260/280	N9316031
0.45*	5	4.25	-60 to 260/280	N9316032
0.45*	15	0.13	-60 to 340/360	N9316033
0.45*	15	0.42	-60 to 310/330	N9316037
0.45*	15	1.27	-60 to 310/330	N9316034
0.45*	15	2.55	-60 to 270/290	N9316035
0.45*	15	4.25	-60 to 260/280	N9316036
0.45*	30	0.42	-60 to 310/330	N9316041
0.45*	30	1.27	-60 to 310/330	N9316038
0.45*	30	2.55	-60 to 270/290	N9316039
0.45*	30	4.25	-60 to 260/280	N9316040
0.45*	60	1.27	-60 to 310/330	N9316042
0.45*	105	2.55	-60 to 270/290	N9316043
0.53	5	5.00	-60 to 270/290	N9316044
0.53	15	0.15	-60 to 320/340	N9316045
0.53	15	0.50	-60 to 310/330	N9316049
0.53	15	1.50	-60 to 310/330	N9316046
0.53	15	3.00	-60 to 270/290	N9316047
0.53	15	5.00	-60 to 270/290	N9316048
0.53	30	0.50	-60 to 310/320	N9316053
0.53	30	1.50	-60 to 310/320	N9316050
0.53	30	3.00	-60 to 270/290	N9316051
0.53	30	5.00	-60 to 270/290	N9316052
0.53	60	1.50	-60 to 310/330	N9316054

*Ferrule size same as 0.53.

Elite-1ht (High-temp) Dimethylpolysiloxane

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (°C)	Part No.
0.25	15	0.10	-60 to 380	N9316268
0.25	30	0.10	-60 to 380	N9316269
0.32	15	0.10	-60 to 380	N9316270
0.32	30	0.10	-60 to 380	N9316271

Gas Chromatography Columns

1.800.561.4646 Canada

PerkinElmer Elite Series Capillary Columns

GC-51

www.perkinelmer.com/essentials

Elite-5 (5%-Diphenyl) – Dimethylpolysiloxane

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (°C)	Part No.
0.05	10	0.05	-60 to 325/350	N9316104
0.05	10	0.20	-60 to 325/350	N9316105
0.10	20	0.10	-60 to 330/350	N9316108
0.10	20	0.40	-60 to 320/340	N9316109
0.18	20	0.18	-60 to 325/340	N9316068
0.18	10	0.18	-60 to 325/340	N9316066
0.18	10	0.40	-60 to 315/330	N9316067
0.18	20	0.40	-60 to 315/330	N9316069
0.18	40	0.40	-60 to 315/330	N9316071
0.20	12	0.33	-60 to 320/350	N9316110
0.20	25	0.33	-60 to 330/350	N9316111
0.20	50	0.33	-60 to 330/350	N9316112
0.25	15	0.10	-60 to 330/350	N9316072
0.25	15	0.25	-60 to 330/350	N9316073
0.25	15	1.00	-60 to 320/340	N9316074
0.25	30	0.10	-60 to 330/350	N9316075
0.25	30	0.25	-60 to 330/350	N9316076
0.25	30	1.00	-60 to 320/340	N9316077
0.25	60	0.10	-60 to 330/350	N9316078
0.25	60	0.25	-60 to 330/340	N9316079
0.25	60	1.00	-60 to 320/350	N9316080
0.32	15	0.10	-60 to 330/350	N9316081
0.32	15	0.25	-60 to 330/350	N9316082
0.32	15	1.00	-60 to 330/350	N9316083
0.32	25	0.52	-60 to 330/350	N9316084
0.32	30	0.10	-60 to 330/350	N9316085
0.32	30	0.25	-60 to 330/350	N9316086
0.32	30	1.00	-60 to 330/350	N9316087
0.32	50	1.00	-60 to 330/350	N9316088
0.32	60	0.10	-60 to 330/350	N9316089
0.32	60	0.25	-60 to 330/350	N9316090
0.32	60	1.00	-60 to 330/350	N9316091
0.45*	15	0.42	-60 to 310/330	N9316093
0.45*	15	1.27	-60 to 310/330	N9316092
0.45*	30	0.42	-60 to 310/330	N9316096
0.45*	30	1.27	-60 to 310/330	N9316094
0.45*	30	4.25	-60 to 270/290	N9316095
0.45*	60	1.27	-60 to 310/330	N9316097
0.53	15	0.50	-60 to 310/330	N9316099
0.53	15	1.50	-60 to 310/330	N9316098
0.53	30	0.50	-60 to 310/330	N9316102
0.53	30	1.50	-60 to 310/330	N9316100
0.53	30	5.00	-60 to 270/290	N9316101
0.53	60	1.50	-60 to 310/330	N9316103

*Ferrule size same as 0.53.

Elite-5ms (5%- Diphenyl) – Dimethylpolysiloxane

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (°C)	Part No.
0.18	20	0.18	-60 to 325/340	N9316276
0.18	40	0.18	-60 to 325/340	N9316277
0.20	12	0.33	-60 to 330/350	N9316301
0.20	25	0.33	-60 to 330/350	N9316302
0.20	50	0.33	-60 to 330/350	N9316303
0.25	15	0.10	-60 to 330/350	N9316278
0.25	15	0.25	-60 to 330/350	N9316279
0.25	15	1.00	-60 to 325/350	N9316280
0.25	30	0.10	-60 to 330/350	N9316281
0.25	30	0.25	-60 to 330/350	N9316282
0.25	30	1.00	-60 to 325/350	N9316283
0.25	30	0.50	-60 to 330/350	N9316284
0.25	60	0.10	-60 to 330/350	N9316285
0.25	60	0.25	-60 to 330/350	N9316286
0.25	60	1.00	-60 to 325/350	N9316287
0.32	15	0.10	-60 to 330/350	N9316288
0.32	15	0.25	-60 to 330/350	N9316289
0.32	15	1.00	-60 to 325/350	N9316290
0.32	25	0.52	-60 to 330/350	N9316291
0.32	30	0.10	-60 to 330/350	N9316292
0.32	30	0.25	-60 to 330/350	N9316293
0.32	30	1.00	-60 to 325/350	N9316294
0.32	30	0.50	-60 to 330/350	N9316295
0.32	60	0.10	-60 to 330/350	N9316296
0.32	60	0.25	-60 to 330/350	N9316297
0.32	60	1.00	-60 to 330/350	N9316298
0.53	15	1.50	-60 to 310/330	N9316299
0.53	30	1.50	-60 to 310/330	N9316300

Elite-5ht (High-temp) (5%-Diphenyl) – Dimethylpolysiloxane

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (°C)	Part No.
0.25	15	0.10	-60 to 400	N9316272
0.25	30	0.10	-60 to 400	N9316273
0.32	15	0.10	-60 to 400	N9316274
0.32	30	0.10	-60 to 400	N9316275

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Elite-17 (50%- Phenyl) – Methylpolysiloxane

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.05	10	0.05	40 to 280/300	N9316138
0.05	10	0.10	40 to 280/300	N9316139
0.10	10	0.10	40 to 280/300	N9316140
0.10	10	0.02	40 to 280/300	N9316141
0.10	20	0.10	40 to 280/300	N9316142
0.10	20	0.20	40 to 280/300	N9316143
0.18	10	0.18	40 to 310/300	N9316113
0.18	10	0.30	40 to 300/320	N9316114
0.18	20	0.18	40 to 310/330	N9316115
0.18	20	0.30	40 to 300/320	N9316116
0.25	15	0.15	40 to 300/320	N9316117
0.25	15	0.25	40 to 300/320	N9316118
0.25	15	0.50	40 to 290/310	N9316119
0.25	30	0.15	40 to 300/320	N9316120
0.25	30	0.25	40 to 300/320	N9316121
0.25	30	0.50	40 to 290/310	N9316122
0.25	60	0.25	40 to 290/310	N9316123
0.32	15	0.15	40 to 300/320	N9316124
0.32	15	0.25	40 to 300/320	N9316125
0.32	15	0.50	40 to 290/310	N9316126
0.32	30	0.15	40 to 300/320	N9316127
0.32	30	0.25	40 to 300/320	N9316128
0.32	30	0.50	40 to 290/310	N9316129
0.45*	5	1.70	40 to 260/280	N9316130
0.45*	15	0.85	40 to 270/290	N9316131
0.45*	30	0.85	40 to 270/290	N9316132
0.45*	60	0.85	40 to 260/280	N9316133
0.53	5	2.00	40 to 250/270	N9316134
0.53	15	1.00	40 to 260/280	N9316135
0.53	30	1.00	40 to 260/280	N9316136
0.53	60	1.00	40 to 260/280	N9316137

*Ferrule size same as 0.53.

Elite-17ht (High-temp) (50%- Phenyl) – Methylpolysiloxane

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.25	15	0.15	40 to 300/320	N9316263
0.25	30	0.15	40 to 300/320	N9316264
0.32	15	0.15	40 to 300/320	N9316265
0.32	30	0.15	40 to 300/320	N9316266
0.32	60	0.15	40 to 300/320	N9316267

Elite-17ms (Low Bleed) (50% Phenyl) Methylpolysiloxane

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.18	20	0.18	40 to 320/340	N9316534
0.25	15	0.15	40 to 300/320	N9316535
0.25	15	0.25	40 to 300/320	N9316536
0.25	30	0.15	40 to 300/320	N9316537
0.25	30	0.25	40 to 300/320	N9316538
0.25	60	0.25	40 to 300/320	N9316539
0.32	15	0.15	40 to 300/320	N9316540
0.32	15	0.25	40 to 300/320	N9316541
0.32	30	0.15	40 to 300/320	N9316542
0.32	30	0.25	40 to 300/320	N9316543

Elite-35 (35%- Diphenyl) – Dimethylpolysiloxane

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.25	30	0.15	40 to 300/320	N9316144
0.25	30	0.25	40 to 300/320	N9316145
0.32	30	0.25	40 to 300/320	N9316146
0.32	30	0.50	40 to 290/310	N9316147
0.45*	15	0.85	40 to 280/300	N9316148
0.45*	30	0.42	40 to 290/310	N9316150
0.45*	30	0.85	40 to 280/300	N9316149
0.53	15	1.00	40 to 260/280	N9316151
0.53	30	0.50	40 to 260/280	N9316153
0.53	30	1.00	40 to 260/280	N9316152

*Ferrule size same as 0.53.

Elite-35ms (35%- Phenyl) – Methylpolysiloxane

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.20	25	0.33	50 to 320/340	N9316446
0.25	15	0.25	50 to 320/340	N9316436
0.25	30	0.15	50 to 320/340	N9316437
0.25	30	0.25	50 to 320/340	N9316438
0.25	60	0.25	50 to 320/340	N9316439
0.32	15	0.25	50 to 320/340	N9316440
0.32	30	0.25	50 to 320/340	N9316441
0.32	60	0.25	50 to 320/340	N9316442
0.53	15	1.00	50 to 290/310	N9316443
0.53	30	1.00	50 to 290/310	N9316444
0.53	30	0.50	50 to 300/320	N9316445

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Elite-225 (50%- Cyanopropylmethyl) – Phenylmethylpolysiloxane

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.05	10	0.05	45 to 220/240	N9316186
0.10	20	0.10	45 to 220/240	N9316187
0.18	10	0.20	45 to 220/240	N9316172
0.18	20	0.20	45 to 220/240	N9316173
0.25	15	0.15	45 to 220/240	N9316174
0.25	15	0.25	45 to 220/240	N9316175
0.25	30	0.15	45 to 220/240	N9316176
0.25	30	0.25	45 to 220/240	N9316177
0.32	15	0.15	45 to 220/240	N9316178
0.32	15	0.25	45 to 220/240	N9316179
0.32	30	0.15	45 to 220/240	N9316180
0.32	30	0.25	45 to 220/240	N9316181
0.45*	15	0.85	40 to 200/220	N9316182
0.45*	30	0.85	40 to 200/220	N9316183
0.53	15	1.00	40 to 200/220	N9316184
0.53	30	1.00	40 to 200/220	N9316185

Elite-502.2 Specialty Phase for Analysis of Volatiles (EPA 502.2)

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.25	60	1.40	0 to 250/270	N9316498
0.45*	105	2.55	0 to 250/270	N9316189
0.45*	75	2.55	0 to 250/270	N9316188
0.53	105	3.00	0 to 250/270	N9316190

Elite-608 Specialty Phase for Semivolatile Pesticides (EPA 608)

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.32	30	0.50	40 to 290/310	N9316191
0.45*	15	0.42	40 to 270/290	N9316194
0.45*	15	0.70	40 to 260/280	N9316192
0.45*	30	0.42	40 to 270/290	N9316195
0.45*	30	0.70	40 to 260/280	N9316193
0.53	15	0.50	40 to 270/290	N9316198
0.53	15	0.83	40 to 260/280	N9316196
0.53	30	0.50	40 to 270/290	N9316199
0.53	30	0.83	40 to 260/280	N9316197

Elite-624 Specialty Phase for Analysis of Volatiles (EPA 624)

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.18	20	1.00	-20 to 240	N9316200
0.20	25	1.12	-20 to 240	N9316209
0.25	30	1.40	-20 to 240	N9316201
0.25	60	1.40	-20 to 240	N9316202
0.32	30	1.80	-20 to 240	N9316203
0.32	60	1.80	-20 to 240	N9316204
0.45*	30	2.55	-20 to 240	N9316205
0.45*	75	2.55	-20 to 240	N9316206
0.53	30	3.00	-20 to 240	N9316207
0.53	75	3.00	-20 to 240	N9316208

Elite-1301 (6%- Cyanopropylphenyl) – Methylpolysiloxane

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.18	10	0.40	-20 to 280	N9316210
0.18	20	0.40	-20 to 280	N9316211
0.25	15	0.25	-20 to 280	N9316212
0.25	15	1.00	-20 to 260/280	N9316213
0.25	30	0.25	-20 to 280	N9316214
0.25	30	1.00	-20 to 260/280	N9316215
0.25	60	0.25	-20 to 280	N9316216
0.25	60	1.00	-20 to 260/280	N9316217
0.32	15	0.25	-20 to 280	N9316218
0.32	30	0.25	-20 to 280	N9316220
0.32	60	0.25	-20 to 280	N9316222
0.32	15	1.00	-20 to 260/280	N9316219
0.32	30	1.00	-20 to 260/280	N9316221
0.32	60	1.00	-20 to 260/280	N9316223
0.45*	15	0.85	-20 to 260/280	N9316224
0.45*	30	0.85	-20 to 260/280	N9316225
0.53	15	1.00	-20 to 260/280	N9316226
0.53	30	1.00	-20 to 260/280	N9316227

*Ferrule size same as 0.53.

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Elite-1701 (14%-Cyanopropylphenyl) – Methylpolysiloxane

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (°C)	Part No.
0.05	10	0.05	-20 to 280	N9316257
0.05	10	0.20	-20 to 280	N9316258
0.10	20	0.10	-20 to 280	N9316259
0.10	20	0.40	-20 to 270/280	N9316260
0.18	10	0.40	-20 to 270/280	N9316228
0.18	20	0.40	-20 to 270/280	N9316229
0.25	15	0.15	-20 to 280	N9316230
0.25	15	0.25	-20 to 280	N9316231
0.25	15	1.00	-20 to 260/280	N9316232
0.25	30	0.25	-20 to 260/280	N9316234
0.25	30	1.00	-20 to 260/280	N9316235
0.25	60	0.15	-20 to 280	N9316236
0.25	60	0.25	-20 to 280	N9316237
0.25	60	1.00	-20 to 260/280	N9316238
0.32	15	0.15	-20 to 280	N9316239
0.32	15	0.25	-20 to 280	N9316240
0.32	15	1.00	-20 to 260/280	N9316241
0.32	30	0.15	-20 to 280	N9316242
0.32	30	0.25	-20 to 280	N9316243
0.32	30	1.00	-20 to 260/280	N9316244
0.32	50	1.00	-20 to 260/280	N9316245
0.32	60	0.15	-20 to 280	N9316246
0.32	60	0.25	-20 to 280	N9316247
0.32	60	1.00	-20 to 260/280	N9316248
0.45*	15	0.42	-20 to 260/270	N9316250
0.45*	15	0.85	-20 to 250/270	N9316249
0.45*	30	0.42	-20 to 260/270	N9316252
0.45*	30	0.85	-20 to 250/270	N9316251
0.53	15	1.00	-20 to 250/270	N9316253
0.53	15	0.50	-20 to 260/270	N9316254
0.53	30	0.50	-20 to 260/270	N9316256
0.53	30	1.00	-20 to 250/270	N9316255

Elite-Betacydex Betacyclodextrin for Chiral Separations

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (°C)	Part No.
0.25	30	0.25	40 to 230	N9316319

Elite-FFAP Nitroterephthalic Acid Modified Polyethylene Glycol (Bonded)

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (°C)	Part No.
0.25	15	0.25	40 to 250	N9316351
0.25	30	0.25	40 to 250	N9316352
0.32	15	0.25	40 to 250	N9316353
0.32	30	0.25	40 to 250	N9316354
0.45*	15	0.85	40 to 240/250	N9316355
0.45*	30	0.85	40 to 240/250	N9316356
0.53	15	1.00	40 to 240/250	N9316357
0.53	30	1.00	40 to 240/250	N9316358

*Ferrule size same as 0.53.

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Elite-PONA Dimethylpolysiloxane Processed for Detailed Analysis of Petroleum Naphtha

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.25	100	0.50	-60 to 300/320	N9316015
0.20	50	0.50	-60 to 300/320	N9316065

Elite-SimDist Dimethylpolysiloxane Processed for Simulated Distillation

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.45*	10	2.55	-60 to 360	N9316261
0.53	10	3.00	-60 to 360	N9316262

Elite-HT SimDist for High-temperature Simulated Distillation

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.53	6	0.15	-60 to 400	N9316572

Elite-TPH Specialty Phase for Analysis of Total Petroleum Hydrocarbons

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.32	30	0.25	-10 to 320	N9316386
0.45*	30	1.00	-10 to 290	N9316387

Elite-MTBE Low Polarity Stationary Phase

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.45	30	2.55	10 to 250	N9316520
0.53	30	3.00	10 to 250	N9316521

Elite-RX for Analysis of Drugs of Abuse

Phase	Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
Elite-1-RX	0.20	12	0.33	-60 to 330/350	N9316345
Elite-1-RX	0.20	25	0.33	-60 to 330/350	N9316346
Elite-5ms-RX	0.20	12	0.33	-60 to 330/350	N9316349
Elite-5ms-RX	0.20	25	0.33	-60 to 330/350	N9316350
Elite-17-RX	0.20	12	0.33	40 to 330/320	N9316347
Elite-17-RX	0.20	25	0.33	40 to 330/320	N9316348

*Ferrule size same as 0.53.



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Elite-Volatiles Specialty Phase for Analysis of Volatile Organic Compounds

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.25	30	1.40	-20 to 240	N9316388
0.25	60	1.40	-20 to 240	N9316389
0.32	30	1.80	-20 to 240	N9316390
0.32	60	1.80	-20 to 240	N9316391
0.45 *	30	2.55	-20 to 240	N9316392
0.45 *	75	2.55	-20 to 240	N9316393

Elite-Wax ETR (Extended Temperature Range) Polyethylene Glycol

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.25	15	0.25	40 to 250	N9316547
0.25	15	0.50	40 to 250	N9316548
0.25	30	0.25	40 to 250	N9316549
0.25	30	0.50	40 to 250	N9316550
0.25	60	0.25	40 to 250	N9316551
0.32	15	0.25	40 to 250	N9316552
0.32	15	0.50	40 to 250	N9316553
0.32	15	1.00	40 to 240/250	N9316554
0.32	30	0.25	40 to 260	N9316555
0.32	30	0.50	40 to 250	N9316556
0.32	30	1.00	40 to 240/250	N9316557
0.32	50	1.00	40 to 240/250	N9316558
0.32	60	0.25	40 to 250	N9316559
0.32	60	0.50	40 to 250	N9316560
0.32	60	1.00	40 to 240/250	N9316561
0.45	5	1.70	40 to 230/250	N9316562
0.45	15	0.85	40 to 240	N9316563
0.45	30	0.85	40 to 240	N9316564
0.45	60	0.85	40 to 240	N9316565
0.53	5	2.00	40 to 220/230	N9316566
0.53	15	1.00	40 to 240/250	N9316567
0.53	15	2.00	40 to 220/230	N9316568
0.53	30	1.00	40 to 240/250	N9316569
0.53	30	2.00	40 to 220/230	N9316570
0.53	60	1.00	40 to 240/250	N9316571

Elite-WAX Polyethylene Glycol

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.05	10	0.05	20 to 240/250	N9316430
0.05	10	0.10	20 to 240/250	N9316431
0.10	10	0.10	20 to 240/250	N9316432
0.10	10	0.20	20 to 240/250	N9316433
0.10	20	0.10	20 to 240/250	N9316434
0.10	20	0.20	20 to 240/250	N9316435
0.18	10	0.18	20 to 240/250	N9316394
0.18	10	0.30	20 to 240/250	N9316395
0.18	20	0.18	20 to 240/250	N9316396
0.18	40	0.30	20 to 250/260	N9316398
0.25	15	0.15	20 to 250	N9316399
0.25	15	0.25	20 to 250	N9316400
0.25	15	0.50	20 to 250	N9316401
0.25	30	0.15	20 to 250	N9316402
0.25	30	0.25	20 to 250	N9316403
0.25	30	0.50	20 to 250	N9316404
0.25	60	0.15	20 to 250	N9316405
0.25	60	0.25	20 to 250	N9316406
0.25	60	0.50	20 to 250	N9316407
0.32	15	0.15	20 to 250	N9316408
0.32	15	0.25	20 to 250	N9316409
0.32	15	0.50	20 to 250	N9316410
0.32	30	0.15	20 to 250	N9316411
0.32	30	0.25	20 to 250	N9316412
0.32	30	0.50	20 to 250	N9316413
0.32	60	0.25	20 to 250	N9316416
0.32	60	0.50	20 to 250	N9316417
0.45 *	5	1.70	50 to 230	N9316418
0.45 *	15	0.42	20 to 250	N9316420
0.45 *	15	0.85	20 to 240/250	N9316419
0.45 *	30	0.42	20 to 250	N9316422
0.45 *	30	0.85	20 to 240/250	N9316421
0.45 *	60	0.85	20 to 240/250	N9316423
0.53	15	0.50	20 to 250	N9316426
0.53	15	1.00	20 to 240/2540	N9316425
0.53	30	0.50	20 to 250	N9316428
0.53	30	1.00	20 to 240/250	N9316427
0.53	60	1.00	20 to 240/250	N9316429

Elite-XLB Specialty Phase for GC/MS with Exceptionally Low Bleed

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.18	20	0.18	30 to 340/360	N9316480
0.20	12	0.33	30 to 340/360	N9316496
0.20	25	0.33	30 to 340/360	N9316497
0.25	15	0.25	30 to 340/360	N9316481
0.25	15	1.00	30 to 340/360	N9316482
0.25	30	0.10	30 to 340/360	N9316483
0.25	30	0.25	30 to 340/360	N9316484
0.25	30	1.00	30 to 340/360	N9316485
0.25	60	0.25	30 to 340/360	N9316487
0.32	15	0.25	30 to 340/360	N9316488
0.32	30	0.10	30 to 340/360	N9316489
0.32	30	0.25	30 to 340/360	N9316490
0.32	30	0.50	30 to 340/360	N9316492
0.32	30	1.00	30 to 340/360	N9316491
0.32	60	0.25	30 to 340/360	N9316493
0.53	15	1.50	30 to 320/340	N9316494
0.53	30	1.50	30 to 320/340	N9316495

*Ferrule size same as 0.53.

PLOT COLUMNS (NON-BONDED PHASE)

Elite-Alumina PLOT Phase for Analysis of Light Hydrocarbons

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.53	30	N/A	-60 to 200	N9316304
0.53	50	N/A	-60 to 200	N9316305

Note: -60° C is the lowest temperature used on this phase in our lab. Lower temperatures may be used depending on the sample.

Elite-Alumina/KCl*

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.53	50	N/A	up to 200	N9316544

*Lower Polarity than Elite Alumina

Elite-Molesieve PLOT Phase for Analysis of Permanent Gases

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.53	30	N/A	-60 to 300	N9316361

Note: -60° C is the lowest temperature used on this phase in our lab. Lower temperatures may be used depending on the sample.

Elite-Q PLOT Phase for Analysis of Light Gases and Hydrocarbons

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.32	30	N/A	-60 to 250	N9316359
0.53	30	N/A	-60 to 250	N9316360

Note: -60° C is the lowest temperature used on this phase in our lab. Lower temperatures may be used depending on the sample.

Elite-Cyclosil B for Chiral Separations

Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
0.25	30	0.25	35 to 230	N9316545
0.32	30	0.25	35 to 230	N9316546

Gas Chromatography Columns

PerkinElmer Elite Series Capillary Columns

1.800.762.4000 US

GC-58

STEEL CAPILLARY GC PHASES (BONDED)

Elite-M Metal

Phase	Inner Diameter (mm i.d.)	Length (m)	Film Thickness (µm)	Temperature Limits (° C)	Part No.
Elite-M1	0.53	15	0.15	-60 to 360	N9316447
Elite-M1	0.53	15	0.50	-60 to 330	N9316451
Elite-M1	0.53	15	1.50	-60 to 310	N9316448
Elite-M1	0.53	15	3.00	-60 to 285	N9316449
Elite-M1	0.53	15	5.00	-60 to 270	N9316450
Elite-M1	0.53	30	0.50	-60 to 330	N9316455
Elite-M1	0.53	30	1.50	-60 to 310	N9316452
Elite-M1	0.53	30	3.00	-60 to 285	N9316453
Elite-M1	0.53	30	5.00	-60 to 270	N9316454
Elite-M1	0.53	60	1.50	-60 to 310	N9316456
Elite-M1	0.53	105	3.00	-60 to 280	N9316457
Elite-M5	0.53	15	1.50	-60 to 300	N9316468
Elite-M5	0.53	15	0.50	-60 to 300	N9316469
Elite-M5	0.53	30	0.50	-60 to 300	N9316472
Elite-M5	0.53	30	1.50	-60 to 300	N9316470
Elite-M5	0.53	30	5.00	-60 to 270	N9316471
Elite-M5	0.53	60	1.50	-60 to 300	N9316473
Elite-M35	0.53	15	1.00	-60 to 260/280	N9316465
Elite-M35	0.53	30	1.00	-60 to 260/280	N9316466
Elite-M35	0.53	30	0.50	-60 to 310	N9316467
Elite-M502.2	0.53	105	3.00	0 to 270	N9316474
Elite-M624	0.53	30	3.00	-20 to 240	N9316475
Elite-M624	0.53	75	3.00	-20 to 240	N9316476
Elite-M1301	0.53	15	1.00	-20 to 260	N9316458
Elite-M1301	0.53	30	1.00	-20 to 260	N9316459
Elite-M1701	0.53	15	0.50	-20 to 270	N9316461
Elite-M1701	0.53	15	1.00	-20 to 260	N9316460
Elite-M1701	0.53	30	0.50	-20 to 270	N9316463
Elite-M1701	0.53	30	1.00	-20 to 260	N9316462
Elite-MSimDist	0.53	10	3.00	-60 to 360	N9316464
Elite-MWAX	0.53	15	1.00	20 to 240	N9316477
Elite-MWAX	0.53	30	1.00	20 to 240	N9316478
Elite-MWAX	0.53	60	1.00	20 to 240	N9316479

FUSED-SILICA TUBING

Deactivated Fused-silica Tubing

Inner Diameter (mm i.d.)	Length (m)	Part No.
0.10	5.0	N9301355
0.18	5.0	N9301354
0.25	5.0	N9301356
0.32	5.0	N9301357
0.53	5.0	N9301358

Gas Chromatography Columns

1.800.561.4646 Canada

EPA Methods

GC-59

www.perkinelmer.com/essentials

EPA Drinking Water Test Methods

Method	Column Recommendation	Part No.	
501.3	Elite-624	30 m x .53 mm i.d., 3.00 µm	N9316207
	Elite-624**	75 m x .53 mm i.d., 3.00 µm	N9316208
	Elite-Volatiles**	30 m x .45 mm i.d., 2.55 µm	N9316392
	Elite-Volatiles**	75 m x .45 mm i.d., 2.55 µm	N9316393
	Elite-502.2	105 m x .53 mm i.d., 3.00 µm	N9316190
502.2†	Elite-624*	30 m x .53 mm i.d., 3.00 µm	N9316207
	Elite-624**	75 m x .53 mm i.d., 3.00 µm	N9316208
	Elite-Volatiles	30 m x .45 mm i.d., 2.55 µm	N9316392
	Elite-Volatiles**	75 m x .45 mm i.d., 2.55 µm	N9316393
	Elite-502.2	105 m x .53 mm i.d., 3.00 µm	N9316190
503.1	Elite-624	30 m x .53 mm i.d., 3.00 µm	N9316207
	Elite-Volatiles**	30 m x .45 mm i.d., 2.55 µm	N9316392
504	Elite-1*	30 m x .32 mm i.d., 0.25 µm	N9316023
	Elite-624**	30 m x .53 mm i.d., 3.00 µm	N9316207
	Elite-Volatiles**	30 m x .45 mm i.d., 2.55 µm	N9316392
505	Elite-1*	30 m x .32 mm i.d., 1.00 µm	N9316024
	Elite-17	30 m x .32 mm i.d., 0.50 µm	N9316129
507	Elite-5*	30 m x .25 mm i.d., 0.25 µm	N9316076
	Elite-5ms**	30 m x .25 mm i.d., 0.25 µm	N9316282
	Elite-1701*	30 m x .25 mm i.d., 0.25 µm	N9316234
508	Elite-5*	30 m x .25 mm i.d., 0.25 µm	N9316076
	Elite-5ms**	30 m x .25 mm i.d., 0.25 µm	N9316282
	Elite-608**	30 m x .32 mm i.d., 0.50 µm	N9316191
	Elite-1701*	30 m x .25 mm i.d., 0.25 µm	N9316234
513	Elite-5ms	60 m x .25 mm i.d., 0.10 µm	N9316285
	Elite-5ms	60 m x .32 mm i.d., 0.10 µm	N9316296
515	Elite-1*	30 m x .32 mm i.d., 0.25 µm	N9316023
515.2	Elite-5*	30 m x .32 mm i.d., 0.25 µm	N9316086
	Elite-5ms**	30 m x .32 mm i.d., 0.25 µm	N9316293
	Elite-1701*	30 m x .32 mm i.d., 0.25 µm	N9316243
524.2†	Elite-624*	30 m x .25 mm i.d., 1.40 µm	N9316201
	Elite-624*	30 m x .53 mm i.d., 3.00 µm	N9316207
	Elite-624*	75 m x .53 mm i.d., 3.00 µm	N9316208
	Elite-5*	30 m x .32 mm i.d., 1.00 µm	N9316087
	Elite-5ms**	30 m x .25 mm i.d., 1.00 µm	N9316283
	Elite-Volatiles**	30 m x .45 mm i.d., 2.55 µm	N9316392
	Elite-Volatiles**	75 m x .45 mm i.d., 2.55 µm	N9316393
	Elite-5*	30 m x .32 mm i.d., 0.25 µm	N9316086
525	Elite-5*	30 m x .32 mm i.d., 0.25 µm	N9316086
	Elite-5ms**	30 m x .25 mm i.d., 1.00 µm	N9316283
548.1	Elite-5*	30 m x .25 mm i.d., 0.25 µm	N9316076
	Elite-5*	30 m x .32 mm i.d., 0.25 µm	N9316086
	Elite-5ms**	30 m x .25 mm i.d., 0.25 µm	N9316282
	Elite-5ms**	30 m x .32 mm i.d., 0.25 µm	N9316293
	Elite-Volatiles**	30 m x .45 mm i.d., 2.55 µm	N9316392
551	Elite-1*	30 m x .32 mm i.d., 1.00 µm	N9316024
	Elite-5ms**	30 m x .25 mm i.d., 1.00 µm	N9316283
552	Elite-1701*	30 m x .32 mm i.d., 0.25 µm	N9316243

* Specified in EPA method.

** This column is highly recommended by PerkinElmer for this EPA method.

† The choice of column for this purge and trap method may depend on your sample concentrator to GC interface.

EPA Wastewater Methods for Organic Chemical Analysis

Method	Column Recommendation	Part No.	
601†	Elite-624	30 m x .53 mm i.d., 3.00 µm	N9316207
	Elite-624**	75 m x .53 mm i.d., 3.00 µm	N9316208
	Elite-Volatiles**	30 m x .45 mm i.d., 2.55 µm	N9316392
	Elite-Volatiles**	75 m x .45 mm i.d., 2.55 µm	N9316393
	Elite-502.2	105 m x .53 mm i.d., 3.00 µm	N9316190
602	Elite-624**	30 m x .53 mm i.d., 3.00 µm	N9316207
	Elite-Volatiles**	30 m x .45 mm i.d., 2.55 µm	N9316392
	Elite-502.2	105 m x .53 mm i.d., 3.00 µm	N9316190
603	Elite-624	30 m x .53 mm i.d., 3.00 µm	N9316207
	Elite-Volatiles**	30 m x .45 mm i.d., 2.55 µm	N9316392
604	Elite-5ms**	30 m x .53 mm i.d., 1.50 µm	N9316300
606	Elite-1	15 m x .53 mm i.d., 1.50 µm	N9316046
607	Elite-5	30 m x .53 mm i.d., 1.50 µm	N9316100
	Elite-5ms**	30 m x .53 mm i.d., 1.50 µm	N9316300
608	Elite-608**	30 m x .53 mm i.d., 0.83 µm	N9316197
609	Elite-5	30 m x .53 mm i.d., 1.50 µm	N9316100
	Elite-5ms**	30 m x .25 mm i.d., 1.00 µm	N9316283
610	Elite-5	30 m x .32 mm i.d., 0.25 µm	N9316086
	Elite-5ms**	30 m x .32 mm i.d., 0.25 µm	N9316293
611	Elite-5	15 m x .53 mm i.d., 1.50 µm	N9316098
	Elite-5ms**	15 m x .53 mm i.d., 1.50 µm	N9316299
612	Elite-1	30 m x .32 mm i.d., 1.00 µm	N9316024
	Elite-5ms**	30 m x .25 mm i.d., 1.00 µm	N9316283
613	Elite-5ms	60 m x .25 mm i.d., 0.10 µm	N9316285
	Elite-5ms**	60 m x .32 mm i.d., 0.10 µm	N9316296
615	Elite-608**	30 m x .53 mm i.d., 0.83 µm	N9316197
	Elite-1701	30 m x .53 mm i.d., 1.00 µm	N9316255
619	Elite-17	30 m x .53 mm i.d., 1.00 µm	N9316136
	Elite-35**	30 m x .53 mm i.d., 1.00 µm	N9316152
622	Elite-5ms**	30 m x .53 mm i.d., 1.50 µm	N9316300
624	Elite-624	30 m x .25 mm i.d., 1.40 µm	N9316201
	Elite-624	30 m x .53 mm i.d., 3.00 µm	N9316207
	Elite-624	75 m x .53 mm i.d., 3.00 µm	N9316208
	Elite-Volatiles**	30 m x .45 mm i.d., 2.55 µm	N9316392
	Elite-Volatiles**	75 m x .45 mm i.d., 2.55 µm	N9316393
625	Elite-5ms**	30 m x .32 mm i.d., 0.25 µm	N9316293
	Elite-5*	30 m x .32 mm i.d., 0.25 µm	N9316086
680	Elite-5ms**	30 m x .32 mm i.d., 0.25 µm	N9316293
	Elite-1	30 m x .53 mm i.d., 1.50 µm	N9316050
1618	Elite-608**	30 m x .53 mm i.d., 0.83 µm	N9316197
	Elite-1701	30 m x .53 mm i.d., 1.00 µm	N9316255
	Elite-624	75 m x .45 mm i.d., 2.55 µm	N9316206
1624	Elite-624**	75 m x .53 mm i.d., 3.00 µm	N9316208
	Elite-5*	30 m x .25 mm i.d., 0.25 µm	N9316076
1625	Elite-5ms**	30 m x .25 mm i.d., 0.25 µm	N9316282
	Elite-5*	30 m x .32 mm i.d., 0.25 µm	N9316086
1653	Elite-5*	30 m x .32 mm i.d., 0.25 µm	N9316086
	Elite-5ms**	30 m x .32 mm i.d., 0.25 µm	N9316293

Gas Chromatography Columns

EPA Methods

1.800.762.4000 US

GC-60

EPA Solid Waste Test Methods

Method	Column Recommendation	Part No.
8010†	Elite-624 75 m x .53 mm i.d., 3.00 µm	N9316208
	Elite-Volatiles** 75 m x .45 mm i.d., 2.55 µm	N9316393
8015	Elite-624 30 m x .53 mm i.d., 3.00 µm	N9316207
	Elite-Volatiles** 30 m x .45 mm i.d., 2.55 µm	N9316392
8020	Elite-624 30 m x .53 mm i.d., 3.00 µm	N9316207
	Elite-Volatiles** 30 m x .45 mm i.d., 2.55 µm	N9316392
8030	Elite-624 30 m x .53 mm i.d., 3.00 µm	N9316207
	Elite-Volatiles** 30 m x .45 mm i.d., 2.55 µm	N9316392
8040	Elite-5ms 30 m x .53 mm i.d., 1.50 µm	N9316300
8060	Elite-1 15 m x .53 mm i.d., 1.50 µm	N9316046
8080	Elite-608** 30 m x .53 mm i.d., 0.83 µm	N9316197
8081	Elite-5* 30 m x .53 mm i.d., 1.50 µm	N9316100
	Elite-608** 30 m x .53 mm i.d., 0.83 µm	N9316197
	Elite-1701* 30 m x .53 mm i.d., 1.00 µm	N9316255
8090	Elite-5 30 m x .53 mm i.d., 1.50 µm	N9316100
	Elite-5ms** 30 m x .53 mm i.d., 1.50 µm	N9316300
8100	Elite-5 30 m x .32 mm i.d., 0.25 µm	N9316086
	Elite-5ms** 30 m x .32 mm i.d., 0.25 µm	N9316293
8120	Elite-1 30 m x .32 mm i.d., 1.00 µm	N9316024
	Elite-5ms** 30 m x .25 mm i.d., 1.00 µm	N9316283
	Elite-5ms** 30 m x .32 mm i.d., 1.00 µm	N9316294
8140	Elite-1 30 m x .53 mm i.d., 1.50 µm	N9316050
	Elite-1701** 30 m x .53 mm i.d., 1.00 µm	N9316255
8141	Elite-5* 15 m x .53 mm i.d., 1.50 µm	N9316098
	Elite-5ms** 30 m x .53 mm i.d., 1.50 µm	N9316300
	Elite-35** 30 m x .53 mm i.d., 0.50 µm	N9316153
8150	Elite-608** 30 m x .53 mm i.d., 0.83 µm	N9316197
	Elite-1701 30 m x .53 mm i.d., 1.00 µm	N9316255
8240†	Elite-624 30 m x .53 mm i.d., 3.00 µm	N9316207
	Elite-624 75 m x .53 mm i.d., 3.00 µm	N9316208
	Elite-Volatiles** 30 m x .45 mm i.d., 2.55 µm	N9316392
	Elite-Volatiles** 75 m x .45 mm i.d., 2.55 µm	N9316393
8250	Elite-5 30 m x .53 mm i.d., 1.50 µm	N9316100
	Elite-5ms** 30 m x .53 mm i.d., 1.50 µm	N9316300
8260	Elite-5* 30 m x .32 mm i.d., 1.00 µm	N9316087
	Elite-624* 30 m x .53 mm i.d., 3.00 µm	N9316207
	Elite-624 75 m x .53 mm i.d., 3.00 µm	N9316208
	Elite-Volatiles** 30 m x .45 mm i.d., 2.55 µm	N9316392
	Elite-Volatiles** 75 m x .45 mm i.d., 2.55 µm	N9316393
	Elite-5ms** 30 m x .25 mm i.d., 1.00 µm	N9316283
8270	Elite-5* 30 m x .32 mm i.d., 1.00 µm	N9316087
	Elite-5ms** 30 m x .25 mm i.d., 0.50 µm	N9316284
8280	Elite-5* 30 m x .25 mm i.d., 0.25 µm	N9316076
	Elite-5ms** 30 m x .25 mm i.d., 1.00 µm	N9316283

* Specified in EPA method.

** This column is highly recommended by PerkinElmer for this EPA method.

† The choice of column for this purge and trap method may depend on your sample concentrator to GC interface.

Gas Chromatography Columns

1.800.561.4646 Canada

Phase Cross-reference

GC-61

www.perkinelmer.com/essentials




Phase	Phase Description	Equivalent Phase
Elite-1, Elite-1ht	100% Dimethyl	Packed: OV-1, OV-101, SP-2100, DC-200, UC-W982, S 96, CP-Sil 5, SE-30 Capillary: DB-1, DB-1ht, HP-1, HP-101, Ultra-1, SPB-1, CP-Sil 5CB, CI-Sil5CBMS, RSL-150, RSL-160, Rtx-1, BP-1, CB-1, OV-1, 007-1(MS), SP-2100, SE-30
Elite-5, Elite-5ms, Elite-5ht	5% Diphenyl – 95% Dimethyl	Packed: OV-3, OV-73, Dexsil 300, Fluorolube, CP-Sil 8 Capillary: DB-5, DB-5ms, DB-5ht, HP-5, Ultra-2, SPB-5, CP-Sil 8CB, RSL-200, Rtx-5, BP-5, CB-5, OV-5, 007-2(MPS-5), SE-52, SE-54, XTI-5, Rtx-5 ms, PTE-5, HP-5MS
Elite-35, Elite-35ms	35% Phenyl – 65% Methyl	Capillary: DB-35, DB-35ms, Rtx-35, SPB-35, AT-35, Sup-Herb
Elite-17, Elite-17ht, Elite-17ms	50% Phenyl – 50% Methyl	Packed: OV-17, OV-11, OV-22, SP-2250, DC-710 Capillary: DB-17, DB-17ht, HP-17, RSL-300, Rtx-50, 007-17(MPS-50), SP-2250, HP-50+
Elite-1301	6% Cyanopropylphenyl – 94% Methyl	Capillary: DB-1301, Rtx-1301, CP-624
Elite-1701	14% Cyanopropylphenyl – 86% Dimethyl	Packed: OV-1701 Capillary: DB-1701, SPB-7, CP-Sil 19CB, Rtx-1701, BP-10, CB-1701, OV-1701, 007-1701
Elite-225	50% Cyanopropylmethyl – 50% Phenylmethyl	Packed: OV-225, Silar 5 CP Capillary: DB-225, HP-225, SP-2330, CP-Sil 43CB, RSL-500, Rtx-225, BP-225, CB-225, OV-225, 007-225
Elite-WAX	Polyethylene Glycol	Packed: Carbowax 20M, SUPEROX, SUPELCOWAX 10, PEG Capillary: DB-FFAP, HP-20M, SUPELCOWAX 10, CP-WAX 52CB, SUPEROX II, CB-WAX, STABILWAX, BP-20, Elite-CW, 007-CW, Carbowax, HP-Innowax
Elite-FFAP	Polyethylene Glycol – Acid Modified	Packed: OV-351, FFAP, Carbowax 20M-Terephthalic acid Capillary: DB-WAX, HP-FFAP, Nukol, SUPEROX FA, STABILWAX-DA, 007-FFAP, OV-351, DB-FFAP
Elite-608	Specialty phase for semivolatiles pesticides (EPA 608)	Capillary: SPB-608, NON-PAKD Pesticide, DB-608, 007-608, HP-608
Elite-624, Elite-Volatiles	Specialty phase for volatiles (EPA 624 and 502.2)	Capillary: DB-624, DB-VRX, VOCOL, NONPAKD AT-624, Rtx-Volatiles, Rtx-502.2, 007-624, 007-502, HP-624, CP-624, Rtx-624
Elite-PONA	Dimethylpolysiloxane processed for detailed analysis of petroleum naphtha	Capillary: DB-Petro100, Petrocol DH, HP-PONA, SPB-1, 007-1, Rtx-1 PONA
Elite-Betacydex	Betacyclodextrin for chiral separations	Capillary: Cyclodex-B, LIPODEX C, Chirasil-D/L-Val, Rt-bDEXm
Elite-Q	PLOT phase for analysis of light gases and hydrocarbons	Packed: Chomosorb 101, HayeSep Q, Porapak Q Capillary: GS-Q, PoraPLOT Q, Rt-QPLOT
Elite-Alumina	PLOT phase for analysis of light hydrocarbons	Packed: Alumina Capillary: GS-Alumina, Al ₂ O ₃ /KC1, Al ₂ O ₃ /Na ₂ SO ₄ , RT-Alumina
Elite-Molesieve	PLOT phase for analysis of permanent gases	Packed: Molesieve 5A Capillary: GS-Molesieve, Molesieve 5A, #PLT-5A, Rt-Molesieve 5A

Gas Chromatography Columns

Packed Columns

1.800.762.4000 US

AutoSystem™ GC 8000 Series/AutoSystem XL

Instrument Type	Material	Shape	Length (ft.)	o.d. (in.)	Packed 2 mm i.d. Part No.	Packed 4 mm i.d. Part No.	Empty 2 mm i.d. Part No.	Empty 4 mm i.d. Part No.	
AutoSystem GC 8000 Series (not on-column)	Stainless		3	1/8	N9305012	–	N9304012	–	
			6	1/8	N9305013	–	N9304013	–	
			12	1/8	N9305014	–	N9304014	–	
	Steel		3	1/4	–	–	–	–	
			6	1/4	–	N9305016	–	N9304016	
			12	1/4	–	N9305017	–	N9304017	
AutoSystem GC/XL (on-column)	Glass		3	1/4	N9305018	–	N9304018	N9304021	
			6	1/4	N9305019	N9305022	N9304019	N9304022	
			12	1/4	–	–	N9304020	N9304023	
	Glass			3	1/4	–	–	N9304046	–
				6	1/4	N9305047	–	N9304047	–
				9	1/4	N9305048	–	N9304048	–

Note: Stainless steel columns are metal-fitted at both ends to contain the packing.
For 3920 on-column applications, please request glass wool plugs instead of metal frits when ordering.

Choose appropriate Part No. from table below. Follow form at bottom of page to choose support material, % liquid phase, and mesh size. This information is required to place an order.

Part No. N9305 _____

Packed Gas Chromatography Column Checklist

The following column packing data will be required to correctly specify a Packed GC Column (Part No. N9305000). The most common choices are presented here. Many other materials can be specified. Fill in "Other" where necessary.

Choose either Section A or Section B (leave the other section blank)

A Adsorbents / porous polymers

Select options from boxes 1 and 2

1 Material (Circle one)	Grade (Circle one)								
Molecular Sieve	4A	5A	13X						
Porapak	N	P	PS	Q	QS	R	S	T	
Haysep	A	D	N	P	Q	R	S	T	
Chromosorb	101	102	103	104	105	106	107	108	
Tenax	TA	GR							
Other									

2 Mesh size ¹	35/60	45/80	50/80
(Circle one)	60/80	80/100	100/120
Other			

Examples: Porapak QS, 50/80 mesh
Molecular Sieve 5A, 60/80 mesh

Notes:

- Not all materials are available in all mesh sizes. Other sizes can be specified in the "Other" blank.
- Maximum percentage of liquid phase that can be loaded onto the adsorbent. When more than one liquid phase is specified, the combined percentages should not exceed the maximum.
- Percentage (by weight) of each stationary phase that is requested. Write in percentage next to the name of the phase. Do not exceed the maximum % load of the support (see Box 3 and note 2).
- The 22 most popular phases are listed. Hundreds of other phases are available from stock. Specify unlisted phase(s) in the "Other" blank.

B Stationary (Liquid) phase coated onto a Support

Select options from boxes 3, 4, and 5

3 Solid Support (Circle one)	Max. % load ²	Grade (Circle one)			
Chromosorb W	15%	NAW	AW	AW-DMCS	HP
Chromosorb P	30%	NAW	AW	AW-DMCS	
Chromosorb G	5%	NAW	AW	AW-DMCS	HP
Chromosorb 750	12%	(no options)			
Chrom Q	15%	(no options)			
Carbopack B	6.6%	(no options)			
Carbopack C	0.8%	(no options)			
Other					

4 Stationary Phase(s) (Liquid phase) (Circle one or two, as required) ³					
Phase	% Load ²	Phase	% Load ²	Phase	% Load ²
Apiezon L	%	DC-200 350 cstk.	%	OV-210	%
Baritone 34	%	FFAP	%	OV-225	%
DEGS (Diethylene Glycol Succinate)	%	HPPO4 (Phosphoric Acid)	%	OV-351	%
Carbowax 1500	%	KOH (Potassium Hydroxide)	%	Polyethylene Glycol - See Carbowax	%
Carbowax 1540	%	OV-1	%	QF-1	%
Carbowax 20M	%	OV-101	%	SE-30	%
DC-200 12,500 cstk.	%	OV-17	%	SE-52	%
Other ⁴	%	Other ⁴	%	Selsconitrile	%

5 Mesh size ¹	50/80	80/100	100/120
(Circle one)	Other		

Examples: 15% DEGS on Chromosorb W-AW 80/100 mesh
1.5% OV-17 + 1.95% OV-210 on Chromosorb W-HP 100/120 mesh
3% SP-1000 on Supelcoport 80/100 mesh (an example of an unlisted phase and solid support)

Gas Chromatography Columns

1.800.561.4646 Canada

PerkinElmer Elite Series – Application Index

GC-63

www.perkinelmer.com/essentials

Environmental	Column	Page	Industrial Chemicals	Column	Page
EPA Method 508 – Pesticides	Elite-5	GC-69	Alcohols	Elite-502.2	GC-76
EPA Method 524.2	Elite-624 (GC/MS)	GC-67	Alcohols and Aldehydes	Elite-WAX ETR	GC-75
EPA Method 551.1	Elite-5	GC-67	Alcohol Mixtures	Elite-WAX ETR	GC-76
EPA Method 8021 – Volatile Organics	Elite-Volatiles	GC-66	Aldehydes	Elite-WAX	GC-75
EPA Method 8021 A and B – Volatile Organics	Elite-624	GC-68	Aromatics	Elite-WAX ETR	GC-74
EPA Method 8081 – Pesticides	Elite-35	GC-69	Industrial Solvents	Elite-MWAX	GC-74
EPA Method 8270 – Semi-volatile Organics	Elite-5 MS	GC-65	Industrial Solvents	Elite-WAX ETR	GC-74
Nitrogen Containing Herbicides	Elite-5	GC-70	Life Sciences	Column	Page
Organic Volatile Impurities – Residual Solvents	Elite-5	GC-64	Anabolic Steroids – Underivatized	Elite-5	GC-77
Pesticides	Elite-5	GC-64	Cannabinoids – TMS Derivatives	Elite-5	GC-77
Food and Flavors	Column	Page	Cocaine and Metabolites	Elite-5	GC-78
Essential Oils – Citronella Java Oil	Elite-1	GC-71	Sympathomimetic Amines – HFBA Derivatives	Elite-5	GC-78
Essential Oils – Lemon Oil	Elite-5	GC-73	Petroleum	Column	Page
Essential Oils – Native Spearmint Oil	Elite-WAX ETR	GC-72	Gasoline Range – BTEX	Elite-502.2	GC-79
Essential Oils – Synthetic Mushroom Aroma	Elite-WAX ETR	GC-72	Prudhoe Bay Crude Oil	Elite-1	GC-79
Sugars – As Alditol Acetates	Elite-225	GC-73	Volatile Hydrocarbons	Elite-Q PLOT	GC-80
Synthetic Essential Oil Mixture	Elite-1	GC-71			



Capillary Column Applications

Environmental

1.800.762.4000 US

GC-64

Organic Volatile Impurities – Residual Solvents

Column: Elite-5
30 m, 0.53 mm i.d., 5.0 μ m

Part No.: N9316101

Sample: Headspace injection of 24 common residual solvents for pharmaceutical processing. Prepared to equal about 500 ppm in the bulk pharmaceutical. Samples shaken and heated at 90° C for 15 minutes, 1 mL headspace injection.

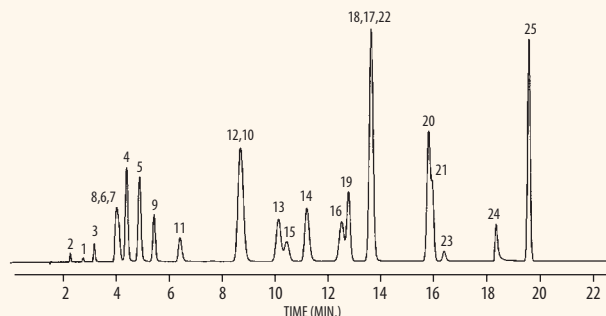
Oven: 35° C (hold 10 min.) to 100° C at 5° C/min., to 240° C at 25° C/min. (hold 5 min.)

Injector: 220° C

Detector: FID, 240° C

Carrier: Helium at 35 cm/sec.

Split ratio: 2:1



- | | | |
|-----------------------|---------------------------|------------------------|
| 1. ethylene oxide | 10. <i>n</i> -hexane | 19. 1,2-dichloroethane |
| 2. methanol | 11. <i>n</i> -propanol | 20. heptane |
| 3. ethanol | 12. methyl ethyl ketone | 21. trichloroethylene |
| 4. diethyl ether | 13. ethyl acetate | 22. <i>n</i> -butanol |
| 5. 1,1-dichloroethene | 14. tetrahydrofuran | 23. 1,4-dioxane |
| 6. acetone | 15. chloroform | 24. pyridine |
| 7. isopropanol | 16. 1,1,1-trichloroethane | 25. toluene |
| 8. acetonitrile | 17. carbon tetrachloride | |
| 9. methylene chloride | 18. benzene | |

Pesticides

Column: Elite-5
30 m, 0.53 mm i.d., 0.50 μ m

Part No.: N9316102

Sample: 1.0 μ l direct injection of a pesticide mix
Concentration: 80-800 ppb (ng/ml)

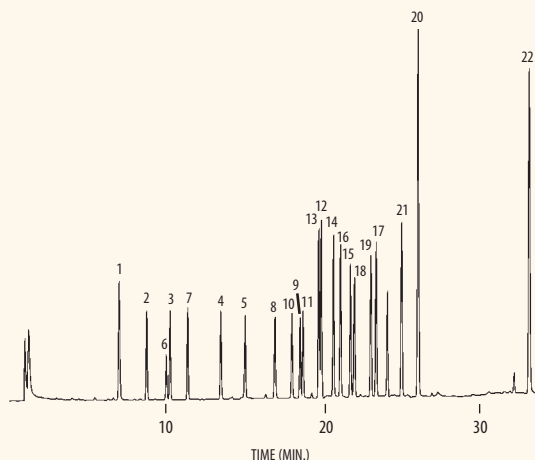
Oven: 150° C (hold 5 min.) to 275° C at 4° C/min. (hold 5 min.)

Injector: 200° C

Detector: ECD, 275° C

Carrier: Helium at 40 cm/sec.

- | | |
|----------------------------------|------------------------|
| 1. tetrachloro- <i>m</i> -xylene | 12. <i>p,p'</i> -DDE |
| 2. α -BHC | 13. dieldrin |
| 3. γ -BHC | 14. endrin |
| 4. heptachlor | 15. <i>p,p'</i> -DDD |
| 5. aldrin | 16. endosulfan II |
| 6. β -BHC | 17. <i>p,p'</i> -DDT |
| 7. δ -BHC | 18. endrin aldehyde |
| 8. heptachlor epoxide | 19. endosulfan sulfate |
| 9. endosulfan I | 20. methoxychlor |
| 10. γ -chlordane | 21. endrin ketone |
| 11. α -chlordane | 22. decachlorobiphenyl |



Capillary Column Applications

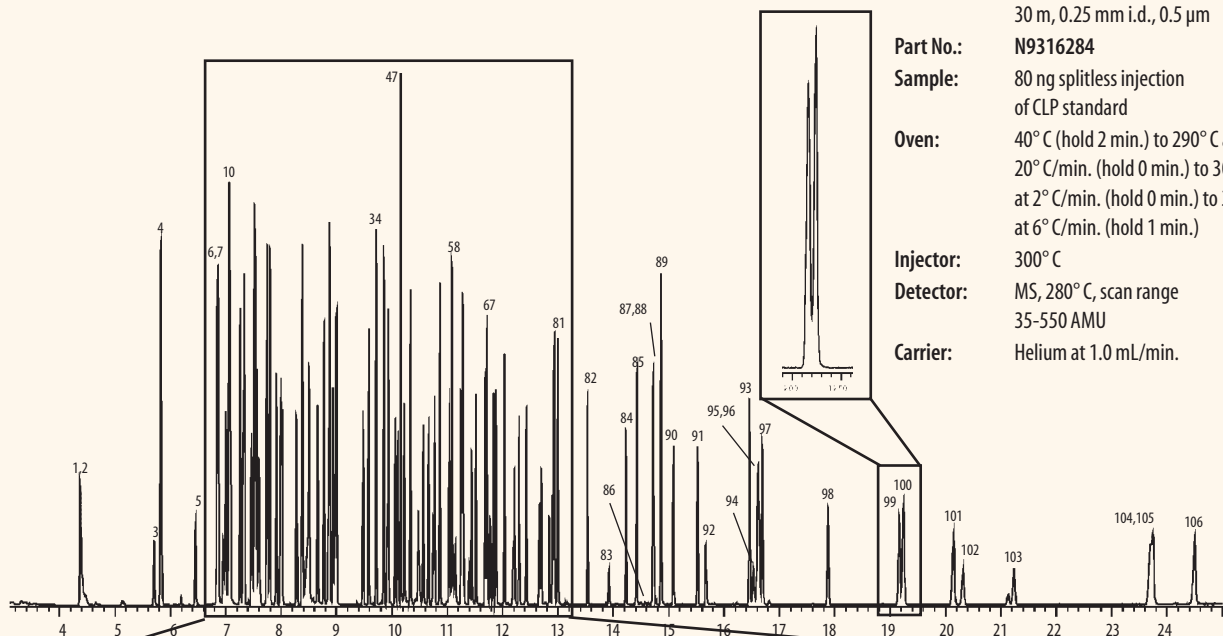
1.800.561.4646 Canada

Environmental

GC-65

www.perkinelmer.com/essentials

EPA Method 8270 – Semi-volatile Organics



Column: Elite-5 MS
30 m, 0.25 mm i.d., 0.5 µm

Part No.: N9316284

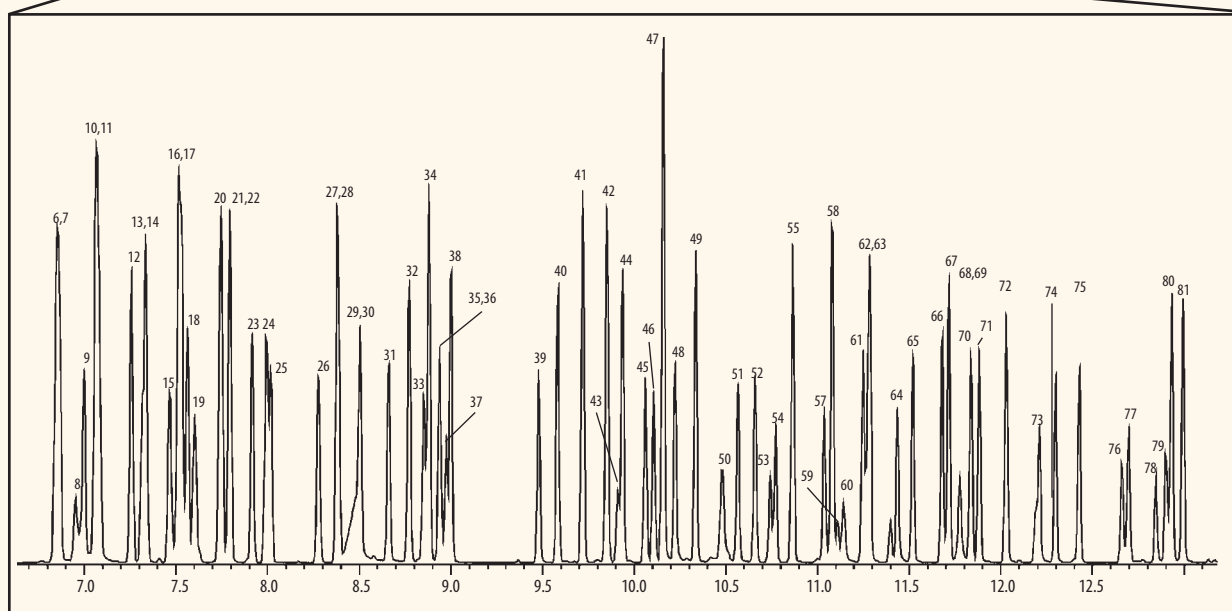
Sample: 80 ng splitless injection of CLP standard

Oven: 40°C (hold 2 min.) to 290°C at 20°C/min. (hold 0 min.) to 303°C at 2°C/min. (hold 0 min.) to 330°C at 6°C/min. (hold 1 min.)

Injector: 300°C

Detector: MS, 280°C, scan range 35-550 AMU

Carrier: Helium at 1.0 mL/min.



- | | | | | | |
|----------------------------|-----------------------------------|--------------------------------|---------------------------------|--------------------------------|--------------------------------|
| 1. N-nitrosodimethylamine | 19. bis(2-chloroisopropyl)ether | 36. 4-chloroaniline | 54. 2,6-dinitrotoluene | 72. 2,4,6-tribromophenol | 90. chlorbenzilate |
| 2. pyridine | 20. 4-methylphenol/3-methylphenol | 37. hexachloropropene | 55. acenaphthylene | 73. phenacetin | 91. butyl benzyl phthalate |
| 3. methyl methanesulfonate | 21. N-nitroso-di-n-propylamine | 38. hexachlorobutadiene | 56. 3-nitroaniline | 74. 4-bromophenyl-phenyl ether | 92. kepone |
| 4. 2-fluorophenol | 22. acetophenone | 39. 4-chloro-3-methylphenol | 57. acenaphthene-d10 | 75. hexachlorobenzene | 93. bis(2-ethylhexyl)phthalate |
| 5. ethyl methanesulfonate | 23. hexachloroethane | 40. isosafrole | 58. acenaphthene | 76. pentachlorophenol | 94. 3,3'-dichlorobenzidine |
| 6. phenol-d6 | 24. nitrobenzene-d5 | 41. 2-methylnaphthalene | 59. 2,4-dinitrophenol | 77. pentachloronitrobenzene | 95. benzo(a)anthracene |
| 7. phenol | 25. nitrobenzene | 42. 1-methylnaphthalene | 60. 4-nitrophenol | 78. dinoseb | 96. chrysene-d12 |
| 8. aniline | 26. nitrobenzene | 43. hexachlorocyclopentadiene | 61. pentachlorobenzene | 79. phenanthrene-d10 | 97. chrysene |
| 9. bis(2-chloroethyl)ether | 27. 2,4-dimethylphenol | 44. 1,2,4,5-tetrachlorobenzene | 62. 2,4-dinitrotoluene | 80. phenanthrene | 98. di-n-octyl phthalate |
| 10. 2-chlorophenol-d4 | 28. 2-nitrophenol | 45. 2,4,6-trichlorophenol | 63. dibenzofuran | 81. anthracene | 99. benzo(k)fluoranthene |
| 11. 2-chlorophenol | 29. benzoic acid | 46. 2,4,5-trichlorophenol | 64. 2,3,4,6-tetrachlorophenol | 82. di-n-butylphthalate | 100. benzo(a)fluoranthene |
| 12. 1,3-dichlorobenzene | 30. bis(2-chloroethoxy)methane | 47. 2-fluorobiphenyl | 65. diethyl phthalate | 83. 4-nitroquinoline-1-oxide | 101. benzo(a)pyrene |
| 13. 1,4-dichlorobenzene-d4 | 31. 2,4-dichlorophenol | 48. safrole | 66. 4-chlorophenyl phenyl ether | 84. isodrin | 102. perylene-d12 |
| 14. 1,4-dichlorobenzene | 32. 1,2,4-trichlorobenzene | 49. 2-chloronaphthalene | 67. fluorene | 85. fluoranthene | 103. 3-methylcholanthrene |
| 15. benzyl alcohol | 33. naphthalene-d8 | 50. 2-nitroaniline | 68. 4-nitroaniline | 86. benzidine | 104. indeno(1,2,3-cd)pyrene |
| 16. 1,2-dichlorobenzene-d4 | 34. naphthalene | 51. 1,4-naphthoquinone | 69. 4,6-dinitro-2-methylphenol | 87. pyrene | 105. dibenzo(a,h)anthracene |
| 17. 1,2-dichlorobenzene | 35. 2,6-dichlorophenol | 52. dimethylphthalate | 70. diphenylamine | 88. aromite | 106. benzo(g,h,i)perylene |
| 18. 2-methylphenol | | 53. 1,3-dinitrobenzene | 71. azobenzene | 89. p-terphenyl-d14 | |

Capillary Column Applications

Environmental

1.800.762.4000 US

GC-66

EPA Method 8021 – Volatile Organics

Column: Elite-Volatiles
20 ppb in 5 mL of RO Water.
75 m, 0.45 mm i.d., 2.55 μ m

Part No.: N9316393

Concentrator: Purge and Trap

Trap: Vocarb 3000

Purge: 11 min. at 40 mL/min.

Dry purge: 1 min. at 40 mL/min. (MCS bypassed with Silcosteel tubing)

Desorb preheat: 245°C

Desorb: 250°C for 2 min.

Bake: 260°C for 8 min.

Interface: direct

Transfer line: 0.32 mm i.d.

Oven: 35°C (hold 12 min.) to 60°C at 5°C/min. (hold 1 min.) to 220°C at 17°C/min. (hold 3 min.)

Carrier: Helium at 9 mL/min.

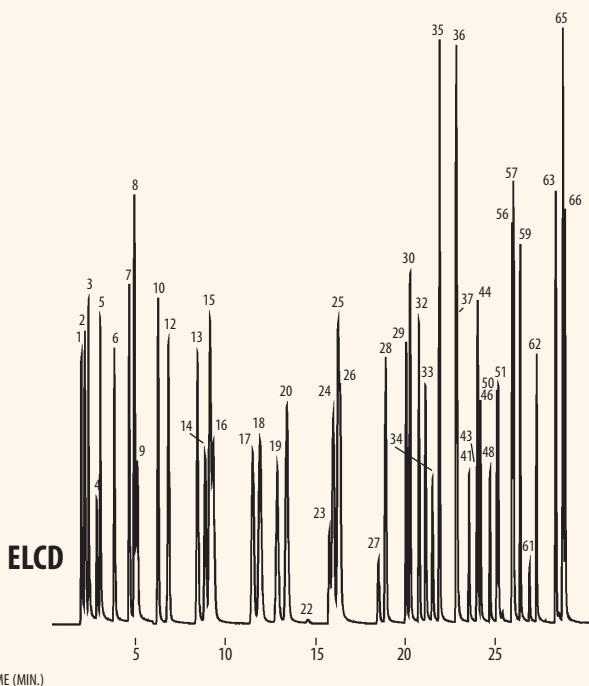
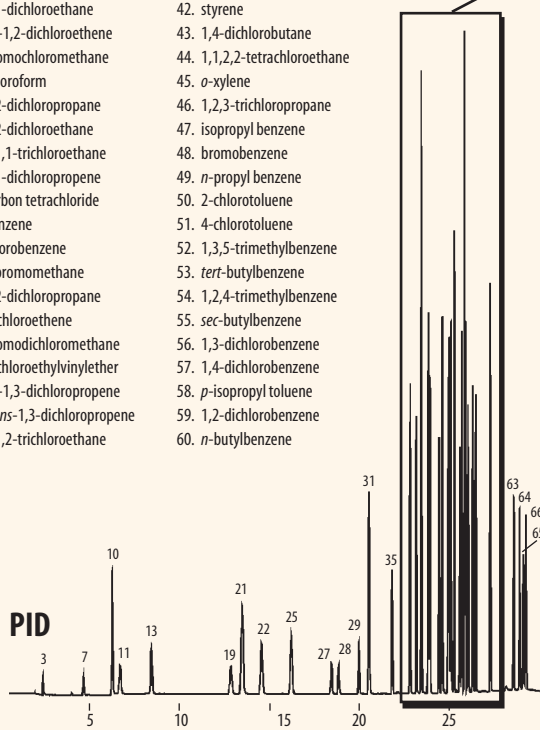
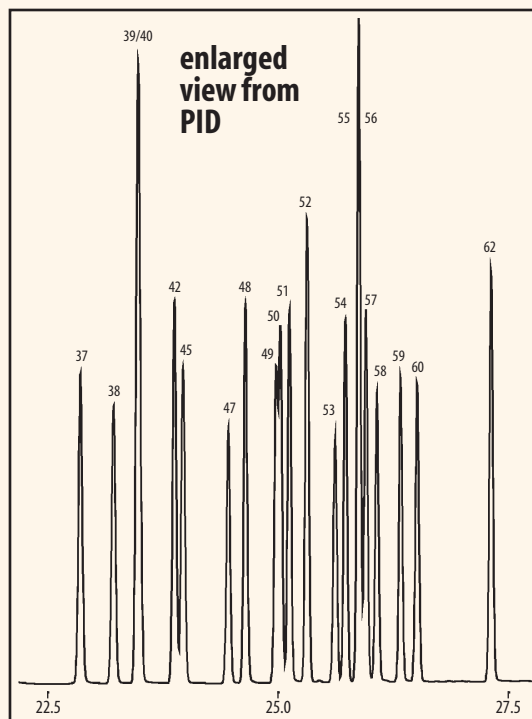
Detectors: PID/ELCD

PID: makeup 7 mL/min., purge 7 mL/min., set at 0.35 mV base temp 200°C

ELCD: Reaction Gas 25mL/min.

Reaction temp.: 940°C, propanol flow 470 μ L/min.

- | | | |
|---------------------------------------|---------------------------------|-------------------------------|
| 1. dichlorodifluoromethane | 31. toluene | 61. 1,2-bromo-3-chloropropane |
| 2. chloromethane | 32. 1,3-dichloropropane | 62. 4-bromo-1-chlorobenzene |
| 3. vinyl chloride | 33. dibromochloromethane | 63. 1,2,4-trichlorobenzene |
| 4. bromomethane | 34. 1,2-dibromoethane | 64. naphthalene |
| 5. chloroethane | 35. tetrachloroethene | 65. hexachlorobutadiene |
| 6. trichlorofluoromethane | 36. 1,1,1,2-tetrachloroethane | 66. 1,2,3-trichlorobenzene |
| 7. 1,1-dichloroethene | 37. chlorobenzene | |
| 8. methylene chloride | 38. ethyl benzene | |
| 9. Freon [®] 113 | 39. <i>m</i> -xylene | |
| 10. <i>trans</i> -1,2-dichloroethene | 40. <i>p</i> -xylene | |
| 11. methyl- <i>tert</i> -butyl-ether | 41. bromoform | |
| 12. 1,1-dichloroethane | 42. styrene | |
| 13. <i>cis</i> -1,2-dichloroethene | 43. 1,4-dichlorobutane | |
| 14. bromochloromethane | 44. 1,1,2,2-tetrachloroethane | |
| 15. chloroform | 45. <i>o</i> -xylene | |
| 16. 2,2-dichloropropane | 46. 1,2,3-trichloropropane | |
| 17. 1,2-dichloroethane | 47. isopropyl benzene | |
| 18. 1,1,1-trichloroethane | 48. bromobenzene | |
| 19. 1,1-dichloropropene | 49. <i>n</i> -propyl benzene | |
| 20. carbon tetrachloride | 50. 2-chlorotoluene | |
| 21. benzene | 51. 4-chlorotoluene | |
| 22. fluorobenzene | 52. 1,3,5-trimethylbenzene | |
| 23. dibromomethane | 53. <i>tert</i> -butylbenzene | |
| 24. 1,2-dichloropropane | 54. 1,2,4-trimethylbenzene | |
| 25. trichloroethene | 55. <i>sec</i> -butylbenzene | |
| 26. bromodichloromethane | 56. 1,3-dichlorobenzene | |
| 27. 2-chloroethylvinylether | 57. 1,4-dichlorobenzene | |
| 28. <i>cis</i> -1,3-dichloropropene | 58. <i>p</i> -isopropyl toluene | |
| 29. <i>trans</i> -1,3-dichloropropene | 59. 1,2-dichlorobenzene | |
| 30. 1,1,2-trichloroethane | 60. <i>n</i> -butylbenzene | |



EPA Method 524.2

Column: Elite-624 (GC/MS)
75 m, 0.53 mm i.d., 3.0 µm

Part No.: N9316208

Sample: 20 ppm of 502.2 Standards Calibration Mixes 1-6

Oven: 35°C (hold 8 min.) to 220°C at 10°C/min. (hold 3 min.)

Detector: MS, 250°C

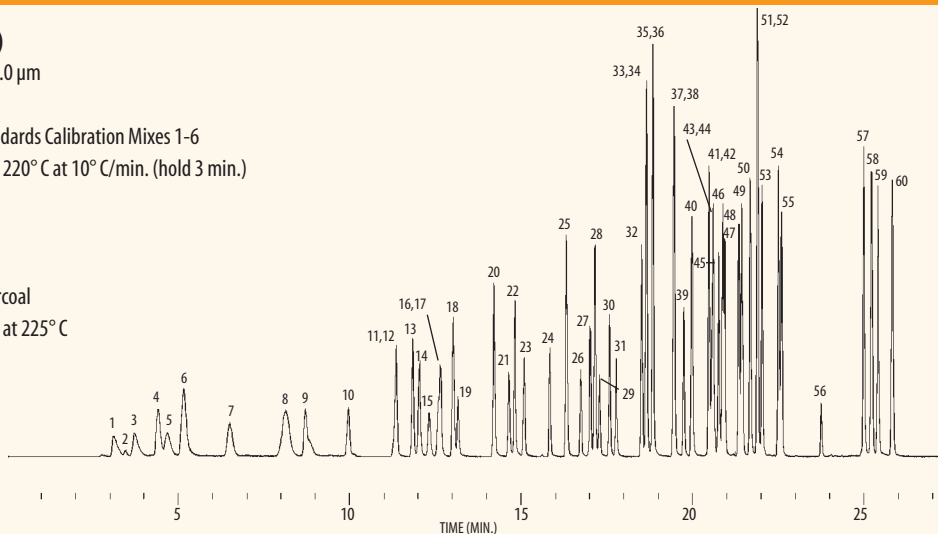
Scan range: 45-300AMU

Purge: 11 min.

Purge and trap: Tenax, Silica Gel, charcoal

Desorb preheat: 220°C, 2 min. desorb at 225°C

Desorb flow rate: 10 mL/min.



Standards used are 524 Volatiles Kit:

- | | | | | |
|-------------------------------------|---------------------------------------|-------------------------------|-------------------------------|---------------------------------|
| 1. dichlorodifluoromethane | 17. 1,1-dichloropropene | 28. tetrachloroethene | 39. bromoform | 50. <i>sec</i> -butylbenzene |
| 2. chloromethane | 18. benzene | 29. 1,3-dichloropropane | 40. isopropylbenzene | 51. 1,3-dichlorobenzene |
| 3. vinyl chloride | 19. 1,2-dichloroethane | 30. dibromochloromethane | 41. bromobenzene | 52. <i>p</i> -isopropyltoluene |
| 4. bromomethane | 20. trichloroethene | 31. 1,2-dibromoethane | 42. 1,1,2,2-tetrachloroethane | 53. 1,4-dichlorobenzene |
| 5. chloroethane | 21. 1,2-dichloropropane | 32. chlorobenzene | 43. 1,2,3-trichloropropane | 54. <i>n</i> -butylbenzene |
| 6. trichlorofluoromethane | 22. dibromomethane | 33. 1,1,1,2-tetrachloroethane | 44. propylbenzene | 55. 1,2-dichlorobenzene |
| 7. 1,1-dichloroethene | 23. bromodichloromethane | 34. ethylbenzene | 45. 2-chlorotoluene | 56. 1,2-dibromo-3-chloropropane |
| 8. methylene chloride | 24. <i>cis</i> -1,3-dichloropropene | 35. <i>m</i> -xylene | 46. 1,3,5-trimethylbenzene | 57. 1,2,4-trichlorobenzene |
| 9. <i>trans</i> -1,2-dichloroethene | 25. toluene | 36. <i>p</i> -xylene | 47. 4-chlorotoluene | 58. hexachlorobutadiene |
| 10. 1,1-dichloroethane | 26. <i>trans</i> -1,3-dichloropropene | 37. <i>o</i> -xylene | 48. <i>tert</i> -butylbenzene | 59. naphthalene |
| 11. <i>cis</i> -1,2-dichloroethene | 27. 1,1,2-trichloroethane | 38. styrene | 49. 1,2,4-trimethylbenzene | 60. 1,2,3-trichlorobenzene |
| 12. 2,2-dichloropropane | | | | |
| 13. bromochloromethane | | | | |
| 14. chloroform | | | | |
| 15. 1,1,1-trichloroethane | | | | |
| 16. carbon tetrachloride | | | | |

EPA Method 551.1

Column: Elite-5
30 m, 0.25 mm i.d., 1.0 µm

Part No.: N9316077

Sample: 1.0 µL split injection, 1 ng on-column concentration

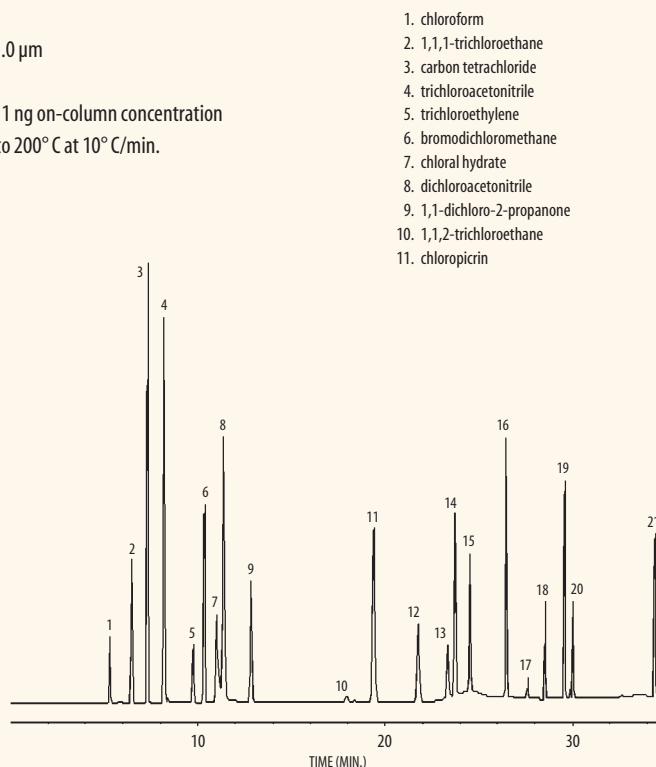
Oven: 35°C (hold 22 min.) to 200°C at 10°C/min.

Injector: 200°C

Detector: ECD, 290°C

Carrier: Helium at 30 cm/sec.

Split ratio: 10:1



- | | |
|-----------------------------|--|
| 1. chloroform | 12. dibromochloromethane |
| 2. 1,1,1-trichloroethane | 13. 1,2-dibromoethane (EDB) |
| 3. carbon tetrachloride | 14. tetrachloroethylene |
| 4. trichloroacetonitrile | 15. bromochloroacetonitrile |
| 5. trichloroethylene | 16. 1,1,1-trichloro-2-propanone |
| 6. bromodichloromethane | 17. bromoform |
| 7. chloral hydrate | 18. dibromoacetonitrile |
| 8. dichloroacetonitrile | 19. 1,2,3-trichloropropane |
| 9. 1,1-dichloro-2-propanone | 20. 4-bromofluorobenzene (I.S.) |
| 10. 1,1,2-trichloroethane | 21. 1,2-dibromo-3-chloropropane (DBCP) |
| 11. chloropicrin | |

Capillary Column Applications

Environmental

1.800.762.4000 US

EPA Method 8021 A and B – Volatile Organics

Column: Elite-624
75 m, 0.45 mm i.d., 2.55 μ m

Part No.: N9316206

Concentrator: Purge and trap

Trap: VOCARB™ 3000

Purge: 11 min. at 40 mL/min.

Dry purge: 1 min. at 40 mL/min.

Desorb preheat: 245° C

Desorb: 250° C for 2 min.

Bake: 260° C for 8 min.

Interface: Direct

Transfer line: 0.45 mm i.d. fused silica

Oven: 35° C (hold 9 min.) to 90° C at 17° C/min. (hold 10 min.), to 220° C at 14° C/min. (hold 5 min.)

Carrier: Helium at 9 mL/min.

Detector A: PID

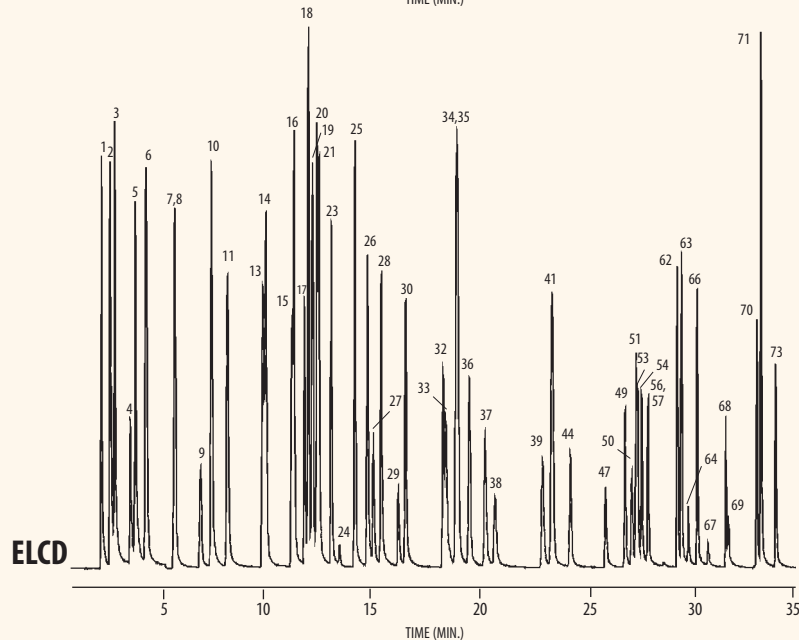
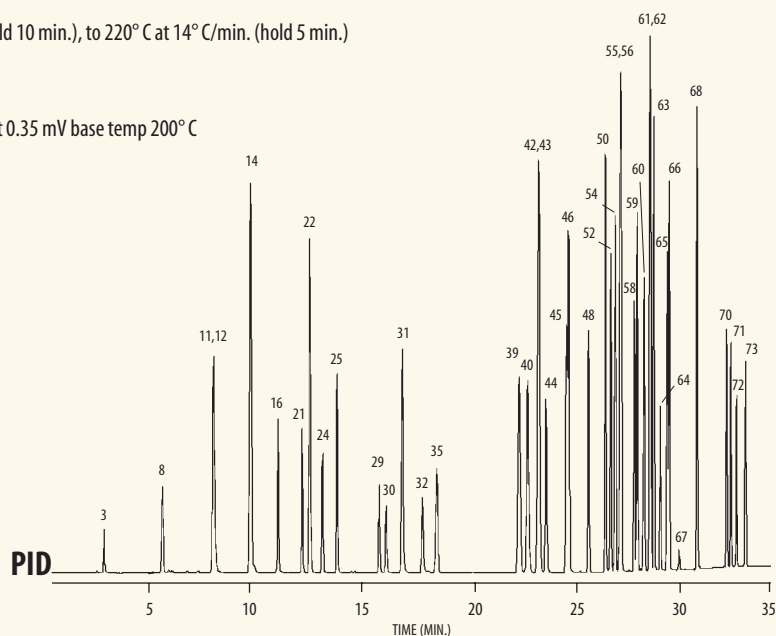
PID: Makeup: 7 mL/min.; Purge: 7 mL/min., set at 0.35 mV base temp 200° C

ELCD: Reaction gas: hydrogen at 25 mL/min.

Detector B: ELCD

Reactor temp.: 940° C; propanol flow: 470 μ L/min.

- | | |
|---------------------------------------|---|
| 1. dichlorodifluoromethane | 39. chlorobenzene |
| 2. chloromethane | 40. ethyl benzene |
| 3. vinyl chloride | 41. 1,1,1,2-tetrachloroethane |
| 4. bromomethane | 42. <i>m</i> -xylene |
| 5. chloroethane | 43. <i>p</i> -xylene |
| 6. trichlorofluoromethane | 44. 1-chloro-2-fluorobenzene |
| 7. Freon® 113 | 45. <i>o</i> -xylene |
| 8. 1,1-dichloroethene | 46. styrene |
| 9. allyl chloride | 47. bromoform |
| 10. methylene chloride | 48. isopropyl benzene |
| 11. <i>trans</i> -1,2-dichloroethene | 49. 1,4-dichlorobutane |
| 12. methyl- <i>tert</i> -butyl-ether | 50. bromobenzene |
| 13. 1,1-dichloroethane | 51. 1,1,2,2-tetrachloroethane |
| 14. chloroprene | 52. <i>n</i> -propyl benzene |
| 15. 2,2-dichloropropane | 53. 1,2,3-trichloropropane |
| 16. <i>cis</i> -1,2-dichloroethene | 54. 2-chlorotoluene |
| 17. bromochloromethane | 55. 1,3,5-trimethylbenzene |
| 18. chloroform | 56. 4-chlorotoluene |
| 19. 1,1,1-trichloroethane | 57. 1,3-dichloro-2-propanol (40 ppb) |
| 20. carbon tetrachloride | 58. <i>tert</i> -butylbenzene |
| 21. 1,1-dichloropropene | 59. 1,2,4-trimethylbenzene |
| 22. benzene | 60. <i>sec</i> -butylbenzene |
| 23. 1,2-dichloroethane | 61. <i>p</i> -isopropyl toluene |
| 24. fluorobenzene | 62. 1,3-dichlorobenzene |
| 25. trichloroethene | 63. 1,4-dichlorobenzene |
| 26. 1,2-dichloropropane | 64. benzyl chloride |
| 27. dibromomethane | 65. <i>n</i> -butylbenzene |
| 28. bromodichloromethane | 66. 1,2-dichlorobenzene |
| 29. 2-chloroethylvinyl ether | 67. bis-2(chloroisopropyl) ether (40 ppb) |
| 30. <i>cis</i> -1,3-dichloropropene | 68. 4-bromo-1-chlorobenzene |
| 31. toluene | 69. 1,2-dibromo-3-chloropropane |
| 32. <i>trans</i> -1,3-dichloropropene | 70. 1,2,4-trichloroethane |
| 33. 2-bromo-1-chloropropane | 71. hexachlorobutadiene |
| 34. 1,1,2-trichloroethane | 72. naphthalene |
| 35. tetrachloroethene | 73. 1,2,3-trichlorobenzene |
| 36. 1,3-dichloropropane | |
| 37. dibromochloromethane | |
| 38. 1,2-dibromoethane | |



EPA Method 8081 – Pesticides

Column: Elite-35
30 m, 0.32 mm i.d., 0.50 µm

Part No.: N9316147

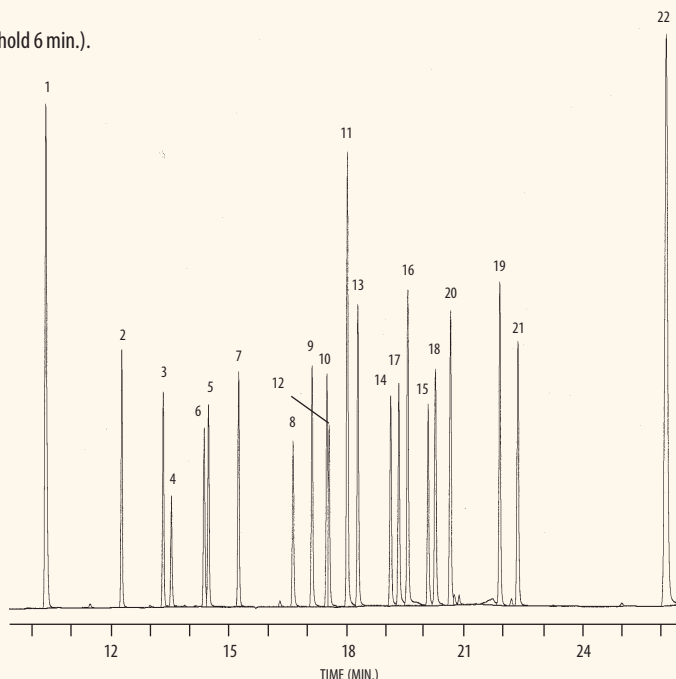
Oven: 120° C (hold 1 min.) to 285° C at 8.5° C/min. (hold 6 min.).

Injector: 200° C

Detector: ECD, 300° C

Carrier: Helium

1. 2,4,5,6-tetrachloro-*m*-xylene
2. α-BHC
3. γ-BHC (lindane)
4. β-BHC
5. δ-BHC
6. heptachlor
7. aldrin
8. heptachlor epoxide
9. γ-chlordane
10. α-chlordane
11. 4,4'-DDE
12. endosulfan I
13. dieldrin
14. endrin
15. 4,4'-DDT
16. endosulfan II
17. 4,4'-DDD
18. endrin aldehyde
19. methoxychlor
20. endosulfan sulfate
21. endrin ketone
22. decachlorobiphenyl



EPA Method 508 – Pesticides

Column: Elite-5
30 m, 0.25 mm i.d., 0.25 µm

Part No.: N9316076

Sample: 2.0 µL splitless injection of a pesticide mix

Splitless hold: 0.75 min.

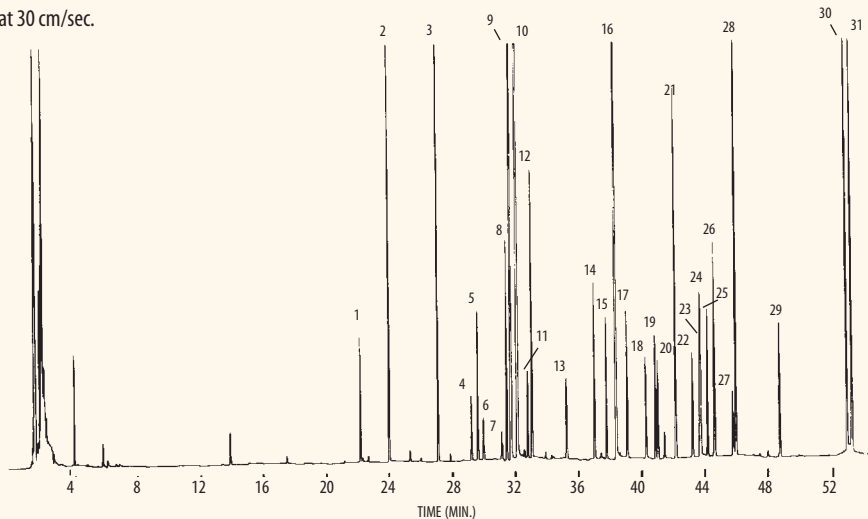
Oven: 60° C to 300° C at 4° C/min. (hold 10 min.)

Injector: 250° C

Detector: ECD, 320° C

Carrier: Helium at 30 cm/sec.

- | | | |
|---------------------------------|-----------------------------------|-----------------------------------|
| 1. etridiazole (50 pg/µL) | 12. chlorothalonil (50 pg/µL) | 23. endosulfan II (30 pg/µL) |
| 2. chlozeb (1000 pg/µL) | 13. heptachlor (20 pg/µL) | 24. chlorobenzilate (1000 pg/µL) |
| 3. propachlor (1000 pg/µL) | 14. aldrin (30 pg/µL) | 25. p,p'-DDD (50 pg/µL) |
| 4. trifluralin (50 pg/µL) | 15. DCPA (50 pg/µL) | 26. endrin aldehyde (50 pg/µL) |
| 5. α-BHC (20 pg/µL) | 16. DCB (SS) (5000 pg/µL) | 27. endosulfan sulfate (30 pg/µL) |
| 6. hexachlorobenzene (10 pg/µL) | 17. heptachlor epoxide (30 pg/µL) | 28. p,p'-DDT (120 pg/µL) |
| 7. β-BHC (20 pg/µL) | 18. γ-chlordane (30 pg/µL) | 29. methoxychlor (100 pg/µL) |
| 8. γ-BHC (30 pg/µL) | 19. endosulfan I (30 pg/µL) | 30. cis-permethrin (1000 pg/µL) |
| 9. PCNB (impurity) (100 pg/µL) | 20. α-chlordane (30 pg/µL) | 31. trans-permethrin (1000 pg/µL) |
| 10. PCNB (IS) (100 pg/µL) | 21. dieldrin (40 pg/µL) | |
| 11. δ-BHC (20 pg/µL) | 22. endrin (30 pg/µL) | |



Capillary Column Applications

Environmental

1.800.762.4000 US

GC-70

Nitrogen Containing Herbicides

Column: Elite-5
30 m, 0.53 mm i.d., 0.50 μm

Part No.: N9316102

Sample: 0.2 μL direct injection of nitrogen containing herbicides.
Concentration approximately 10 ng per component.

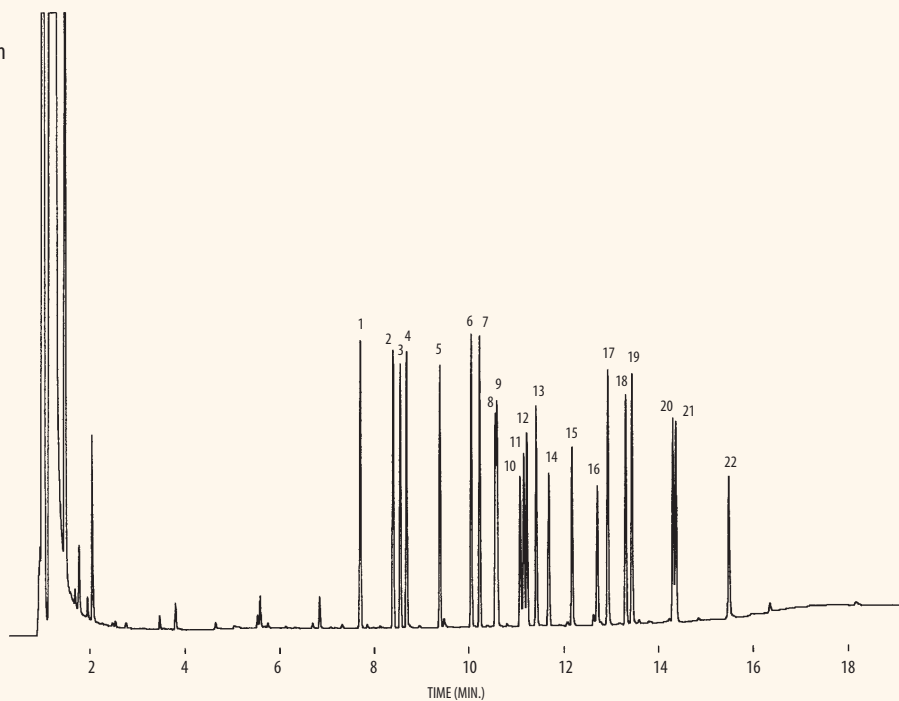
Oven: 60°C (hold 1 min.) to 290°C at 15°C/min. (hold 5 min.)

Injector: 290°C

Detector: FID, 290°C

Carrier: Helium at 40 cm/sec.

- | | |
|--------------------------|--------------------------|
| 1. Eptam [®] | 12. propazine |
| 2. Sutan [®] | 13. Tolban [®] |
| 3. Vernam [®] | 14. terbacil |
| 4. Tillam [®] | 15. Sencor [®] |
| 5. Ordram [®] | 16. bromacil |
| 6. propachlor | 17. Dual [®] |
| 7. Ro-Neet [®] | 18. Paarlan [®] |
| 8. Trefflan [®] | 19. Prowl [®] |
| 9. Balan [®] | 20. oxadiazon |
| 10. simazine | 21. GOAL [®] |
| 11. atrazine | 22. hexazinone |



Synthetic Essential Oil Mixture

Column: Elite-1
60 m, 0.25 mm i.d., 0.25 μ m

Part No. N9316013

Sample: 1.0 μ L split injection of 42 flavor components.

Oven: 100° C to 260° C at 4° C/min. (hold 1 min.)

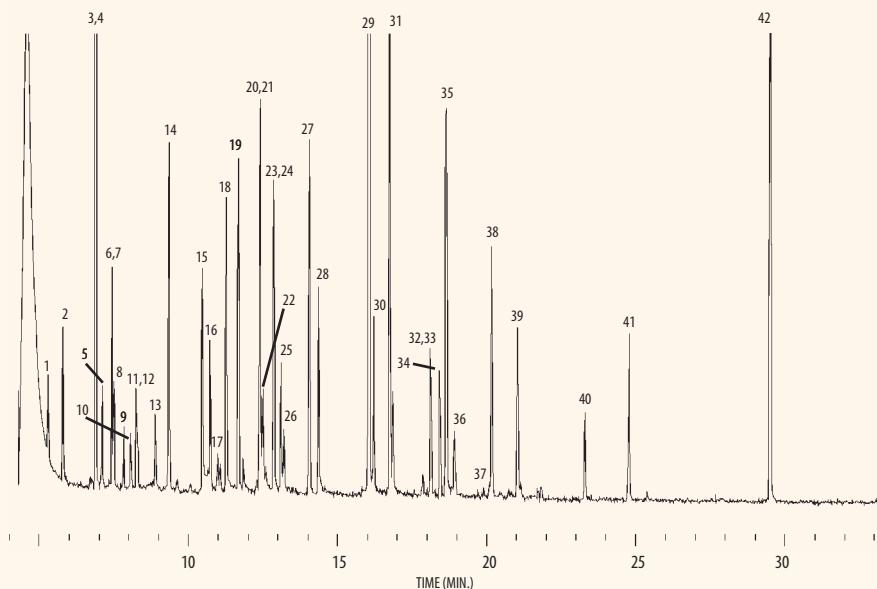
Injector: 250° C

Detector: 280° C

Carrier: Helium at 30 cm/sec.

Split vent: 100 cc/min.

- | | |
|------------------------------------|-----------------------------|
| 1. ethyl butyrate | 22. nerol |
| 2. <i>trans</i> -2-hexenol | 23. carveol |
| 3. α -pinene | 24. anisaldehyde |
| 4. benzaldehyde | 25. carvone |
| 5. camphene | 26. geraniol |
| 6. octanol | 27. anethole |
| 7. β -myrcene | 28. cinnamic alcohol |
| 8. β -pinene | 29. eugenol |
| 9. α -phellandrene | 30. neryl acetate |
| 10. <i>p</i> -cymene | 31. geranyl acetate |
| 11. l-limonene | 32. vanillin |
| 12. camphor | 33. coumarin |
| 13. <i>trans</i> -sabinene hydrate | 34. α -ionone |
| 14. linalool | 35. ethyl vanillin |
| 15. citronellal | 36. β -caryophyllene |
| 16. l-menthone | 37. α -caryophyllene |
| 17. menthofuran | 38. β -ionone |
| 18. l-menthol | 39. valencene |
| 19. α -terpineol | 40. ethyl laurate |
| 20. linalyl acetate | 41. amyl cinnamic aldehyde |
| 21. β -citronellol | 42. nootketone |



Essential Oils – Citronella Java Oil

Column: Elite-1
60 m, 0.25 mm i.d., 0.25 μ m

Part No. N9316013

Sample: 1.0 μ L split injection of Citronella Java Oil

Oven: 100° C to 260° C at 4° C/min. (hold 1 min.)

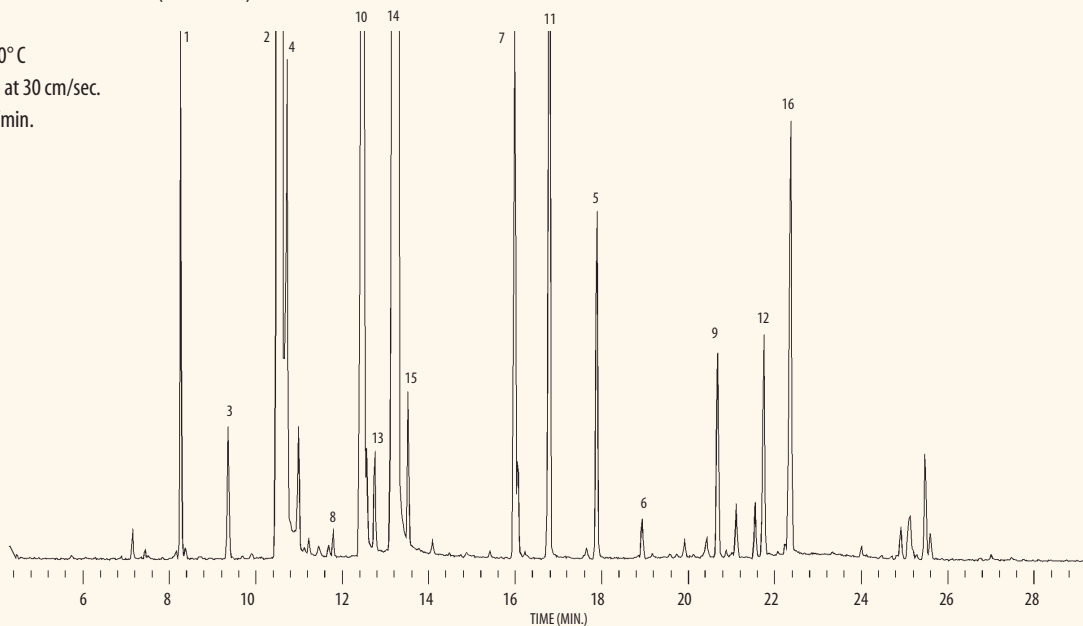
Injector: 250° C

Detector: MS, 280° C

Carrier: Helium at 30 cm/sec.

Split vent: 100 cc/min.

- | |
|---------------------------|
| 1. limonene |
| 2. citronellal |
| 3. linalool |
| 4. borneol |
| 5. γ -elemene |
| 6. β -caryophyllene |
| 7. neryl acetate |
| 8. α -terpineol |
| 9. germancrene- Δ |
| 10. β -citronellol |
| 11. geranyl acetate |
| 12. δ -cadenene |
| 13. nerol |
| 14. geraniol |
| 15. eugenol |
| 16. α -bergamotene |



Capillary Column Applications

Food and Flavors

1.800.762.4000 US

GC-72

Essential Oils – Synthetic Mushroom Aroma

Column: Elite-WAX ETR

30 m, 0.32 mm i.d., 1.0 µm

Part No.: N9316557

Sample: 1.0 µL split injection of a synthetic mushroom aroma, concentration 10 ng per component

Oven: 40° C to 220° C at 6° C/min.

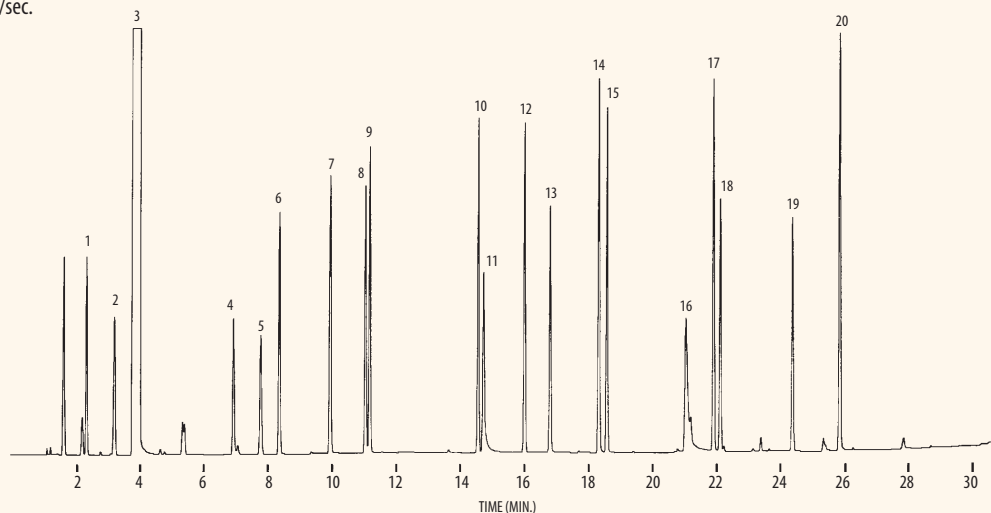
Injector: 260° C

Detector: FID, 260° C

Carrier: Hydrogen at 40 cm/sec.

Split ratio: 100:1

1. acetone
2. ethyl acetate
3. methylene chloride
4. hexanal
5. amyl acetate
6. 1-butanol
7. 3-methyl-1-butanol
8. 1-pentanol
9. 3-octanone
10. 3-octanol
11. nonanal
12. 1-octen-3-ol
13. furfural
14. benzaldehyde
15. octyl alcohol
16. phenylacetaldehyde
17. α -terpineol
18. 2,4-nonadienal
19. 2,4-decadienal
20. benzyl alcohol



Essential Oils – Native Spearmint Oil

Column: Elite-WAX ETR

60 m, 0.25 mm i.d., 0.25 µm

Part No.: N9316551

Sample: 0.2 µL split injection of a neat spearmint oil

Oven: 75° C (hold 4 min.) to 200° C at 4° C/min. (hold 10 min.)

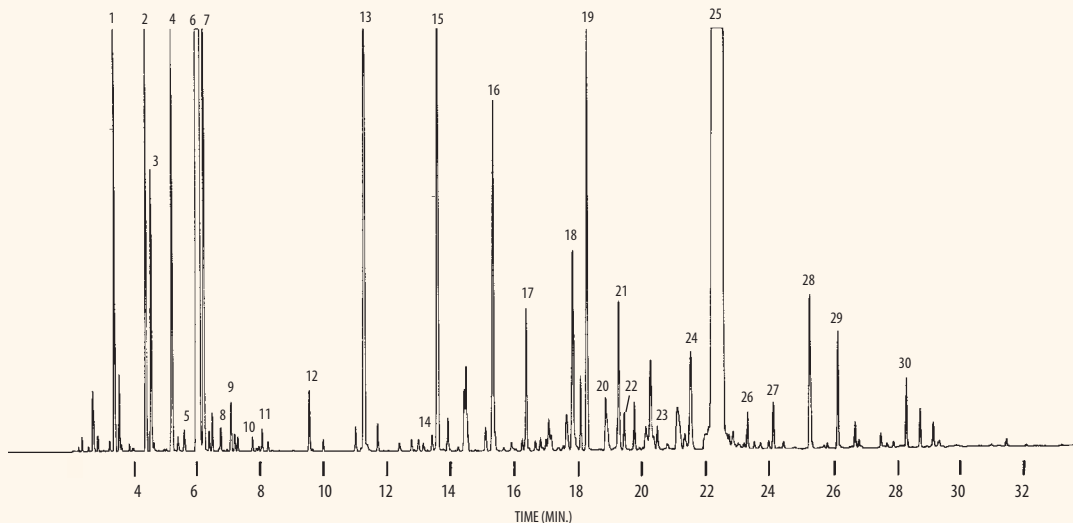
Injector: 250° C

Detector: FID, 250° C

Carrier: Hydrogen at 40 cm/sec.

Split ratio: 100:1

- | | | |
|------------------------|-----------------------------------|---|
| 1. α -pinene | 11. terpinolene | 21. <i>trans</i> -dihydrocarvyl acetate |
| 2. β -pinene | 12. 3-octyl acetate | 22. <i>trans</i> - β -farnesene |
| 3. sabinene | 13. 3-octanol | 23. α -terpineol |
| 4. myrcene | 14. L-menthone | 24. germacrene- Δ |
| 5. α -terpinene | 15. <i>trans</i> -sabinenehydrate | 25. carvone |
| 6. L-limonene | 16. β -bourbonene | 26. <i>cis</i> -carvyl acetate |
| 7. 1,8-cineole | 17. linalool | 27. <i>trans</i> -carveol |
| 8. <i>cis</i> -ocimene | 18. terpinene-4-ol | 28. <i>cis</i> -carveol |
| 9. γ -terpinene | 19. β -caryophyllene | 29. <i>cis</i> -jasmone |
| 10. <i>p</i> -cymene | 20. dihydrocarvone | 30. viridiflorol |



Essential Oils – Lemon Oil

Column: Elite-5
30 m, 0.32 mm i.d., 0.25 μ m

Part No.: N9316086

Sample: Wet needle split injection of a neat lemon oil

Oven: 75°C (hold 8 min.) to 250°C at 4°C/min.

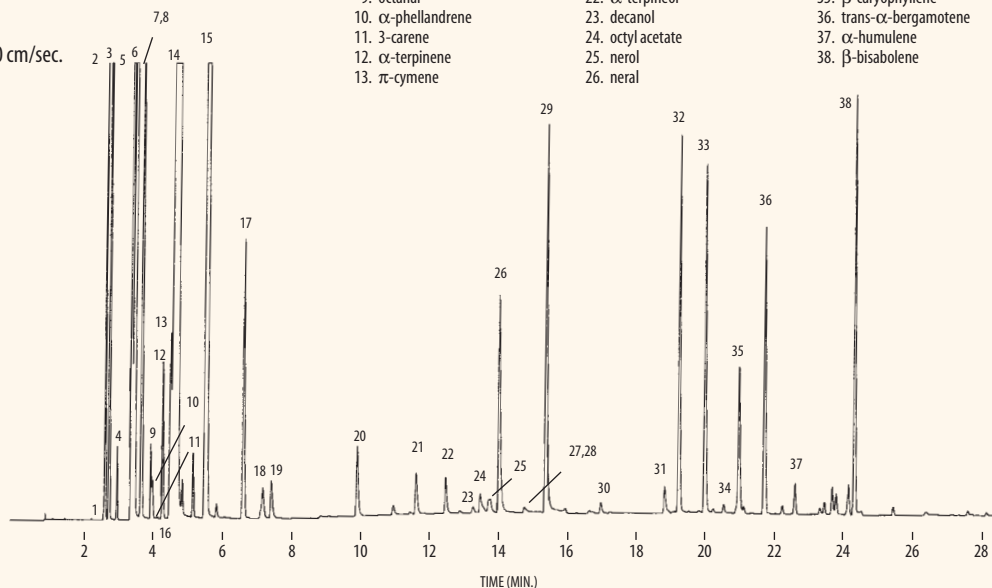
Injector: 250°C

Detector: FID, 250°C

Carrier: Hydrogen at 40 cm/sec.

Split ratio: 100:1

- | | | |
|----------------------------|-------------------------|----------------------------------|
| 1. heptanol | 14. limonene | 27. carvone |
| 2. α -thujene | 15. γ -terpinene | 28. geraniol |
| 3. α -pinene | 16. octanol | 29. geranial |
| 4. camphene | 17. terpinolene | 30. nonyl acetate |
| 5. sabinene | 18. linalool | 31. citronellyl acetate |
| 6. β -pinene | 19. nonanal | 32. neryl acetate |
| 7. 6-methyl-5-hepten-2-one | 20. citronellal | 33. geranyl acetate |
| 8. myrcene | 21. terpinen-4-ol | 34. dodecanal |
| 9. octanal | 22. α -terpineol | 35. β -caryophyllene |
| 10. α -phellandrene | 23. decanol | 36. trans- α -bergamotene |
| 11. 3-carene | 24. octyl acetate | 37. α -humulene |
| 12. α -terpinene | 25. nerol | 38. β -bisabolene |
| 13. π -cymene | 26. neral | |



Sugars – As Alditol Acetates

Column: Elite-225
15 m, 0.25 mm i.d., 0.25 μ m

Part No.: N9316175

Sample: 0.5 μ L split injection of alditol acetate derivatives

Oven: 190°C (hold 5 min.) to 250°C at 8°C/min. (hold 5 min.)

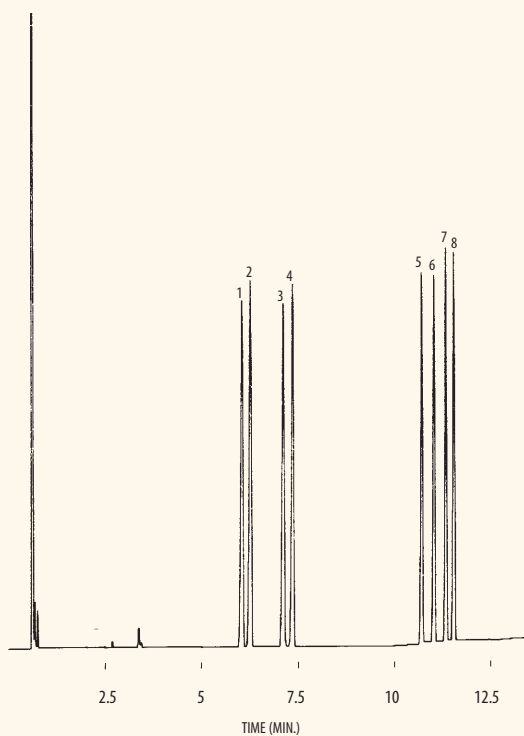
Injector: 260°C

Detector: 260°C

Carrier: Helium at 42 cm/sec.

Split ratio: 50:1

1. rhamnitol
2. fucitol
3. ribitol
4. arabinitol
5. mannitol
6. galactitol
7. glucitol
8. inositol



Capillary Column Applications

Industrial Chemicals

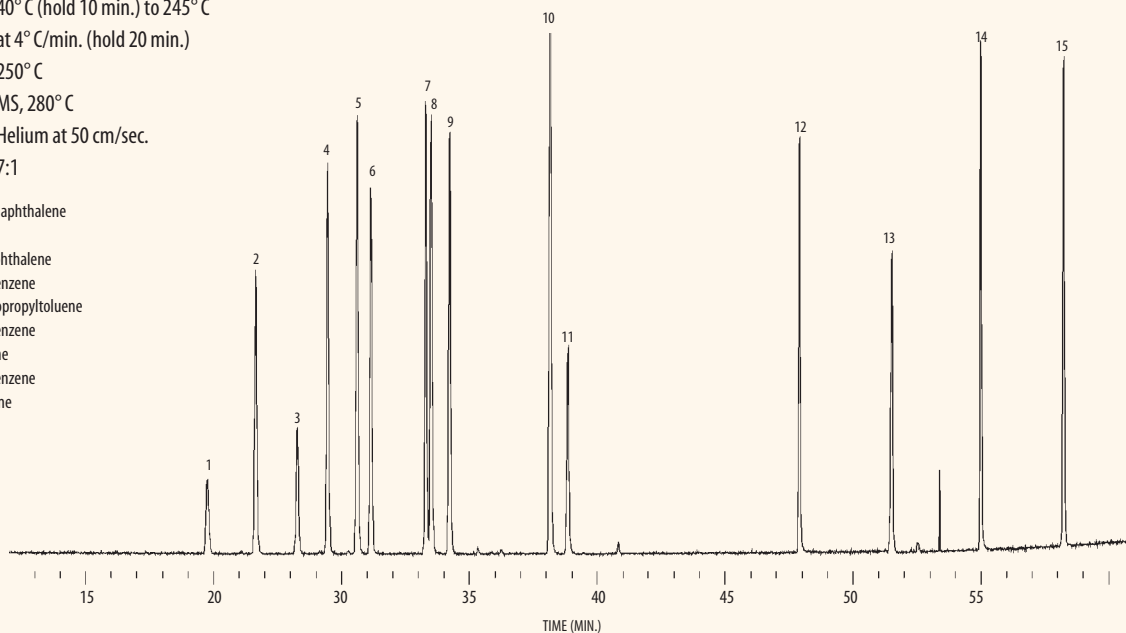
1.800.762.4000 US

GC-74

Aromatics

Column: Elite-WAX ETR
60 m, 0.53 mm i.d., 1.0 μ m
Part No.: N9316571
Sample: 1.0 μ L split injection of an aromatics mixture
Oven: 40°C (hold 10 min.) to 245°C
at 4°C/min. (hold 20 min.)
Injector: 250°C
Detector: MS, 280°C
Carrier: Helium at 50 cm/sec.
Split ratio: 7:1

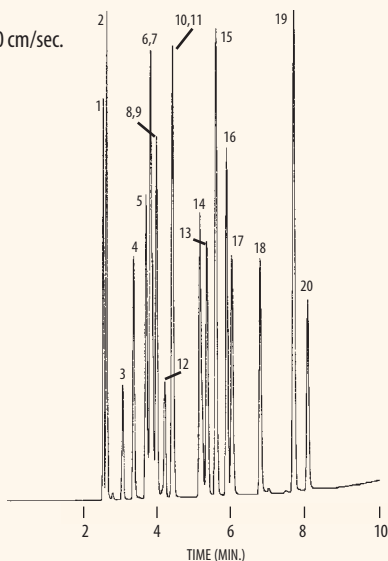
1. *trans*-decahydronaphthalene
2. 1,2-xylene
3. *cis*-decahydronaphthalene
4. 1,3,5-trimethylbenzene
5. *p*-cymene or *p*-isopropyltoluene
6. 1,2,4-trimethylbenzene
7. α -methyl benzene
8. 1,2,3-trimethylbenzene
9. diisopropylbenzene
10. triethylbenzene
11. pentadecane
12. nitrobenzene
13. nonadecane
14. *o*-cresol
15. bibenzyl



Industrial Solvents

Column: Elite-MWAX
30 m, 0.53 mm i.d., 1.0 μ m
Part No.: N9316478
Sample: Wet needle injection of neat solvents
Oven: 50°C to 220°C at 10°C/min.
Injector: 250°C
Detector: FID, 250°C
Carrier: Helium at 20 cm/sec.

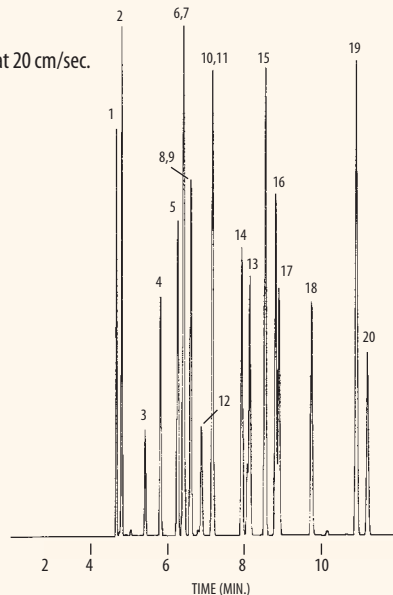
1. pentane
2. hexane
3. methyl formate
4. acetone
5. tetrahydrofuran
6. 1,1,1-trichloroethane
7. ethyl acetate
8. methanol
9. methylethyl ketone
10. methylene chloride
11. chloroform
12. benzene
13. *n*-propyl alcohol
14. *sec*-butyl alcohol
15. toluene
16. *n*-butyl acetate
17. isobutyl alcohol
18. *n*-butyl alcohol
19. *o*-xylene
20. ethoxyethane



Industrial Solvents

Column: Elite-WAX ETR
30 m, 0.53 mm i.d., 1.0 μ m
Part No.: N9316569
Sample: Wet needle injection of neat solvents
Oven: 50°C to 220°C at 10°C/min.
Injector: 250°C
Detector: 250°C
Carrier: Helium at 20 cm/sec.

1. pentane
2. hexane
3. methyl formate
4. acetone
5. tetrahydrofuran
6. 1,1,1-trichloroethane
7. ethyl acetate
8. methanol
9. methylethyl ketone
10. methylene chloride
11. chloroform
12. benzene
13. *n*-propyl alcohol
14. *sec*-butyl alcohol
15. toluene
16. *n*-butyl acetate
17. isobutyl alcohol
18. *n*-butyl alcohol
19. *o*-xylene
20. ethoxyethane



Aldehydes

Column: Elite-WAX
30 m, 0.25 mm i.d., 0.50 μ m

Part No.: N9316404

Sample: Split injection of C2-C11 aldehydes mixture
On-column concentration: 250 ng

Oven: 40°C (hold 5 min.) to 200°C at 10°C/min.

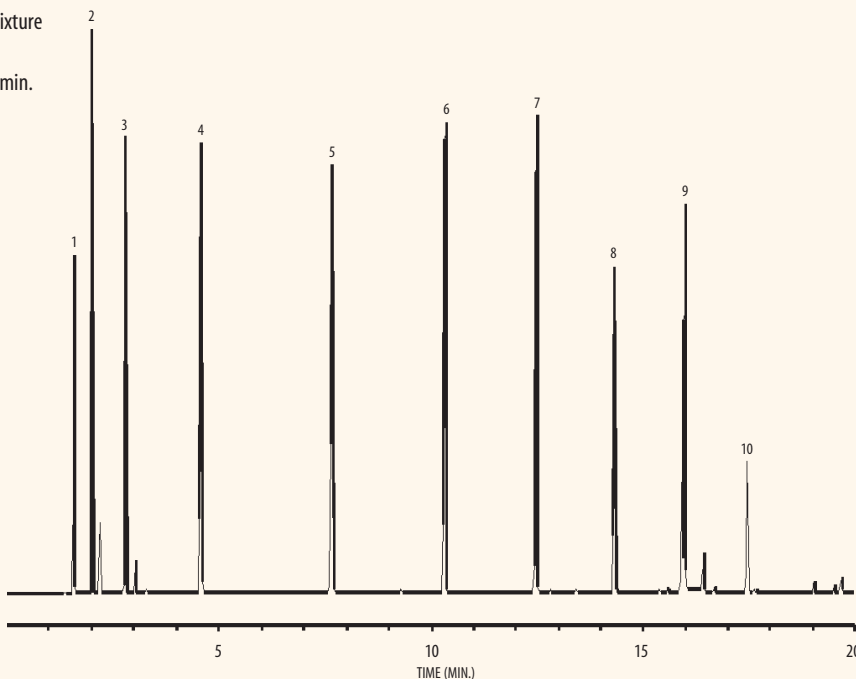
Injector: 200°C

Detector: 200°C

Carrier: Hydrogen at 35 cm/sec.

Split ratio: 100:1

1. ethanal
2. propanal
3. butenal
4. pentanal
5. hexanal
6. heptanal
7. octanal
8. nonanal
9. decanal
10. undecanal



Alcohols and Aldehydes

Column: Elite-WAX ETR
60 m, 0.53 mm i.d., 1.0 μ m

Part No.: N9316571

Sample: 1.0 μ L split injection of alcohols and aldehydes

Oven: 45°C (hold 10 min.) to 250°C at 12°C/min. (hold 20 min.)

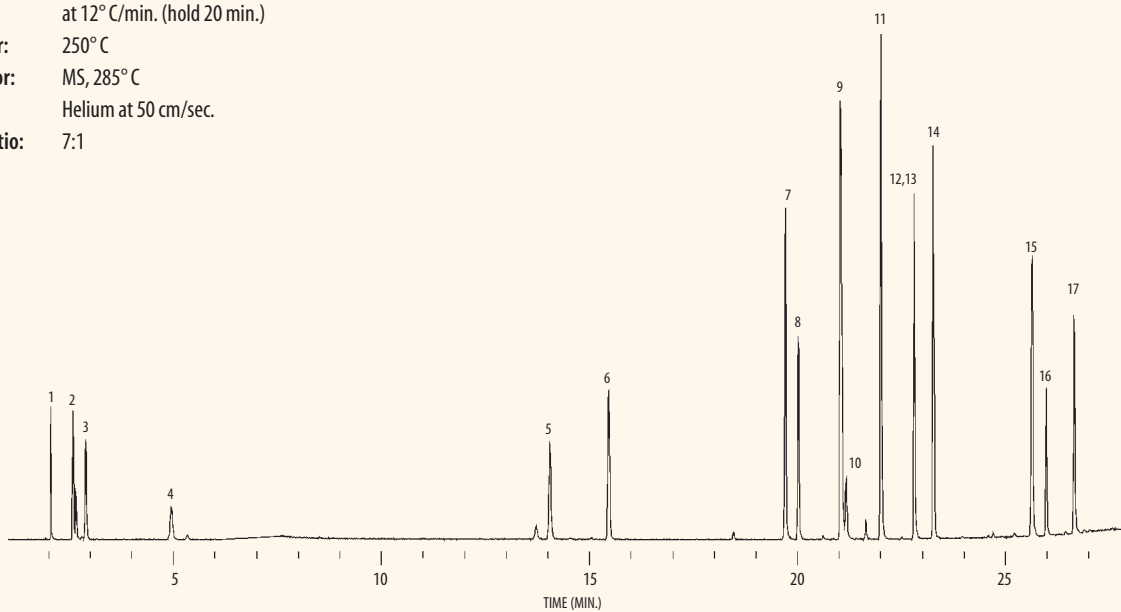
Injector: 250°C

Detector: MS, 285°C

Carrier: Helium at 50 cm/sec.

Split ratio: 7:1

- | | | |
|----------------------|------------------|--|
| 1. pentane | 7. 1-penten-3-ol | 13. ethylene glycol and 2-methyl-2,4-pentanediol |
| 2. heptane | 8. 3-octanol | 14. furfuryl alcohol |
| 3. acetaldehyde | 9. cyclohexanol | 15. nonadecane |
| 4. dimethoxy methane | 10. furfural | 16. 1,4-butanediol |
| 5. butyraldehyde | 11. pentadecane | 17. diethylene glycol |
| 6. 3-pentanol | 12. benzaldehyde | |



Capillary Column Applications

Industrial Chemicals

1.800.762.4000 US

GC-76

Alcohol Mixtures

Column: Elite-WAX ETR

60 m, 0.53 mm i.d., 1.0 µm

Part No.: N9316571

Sample: 1.0 µL split injection of alcohols

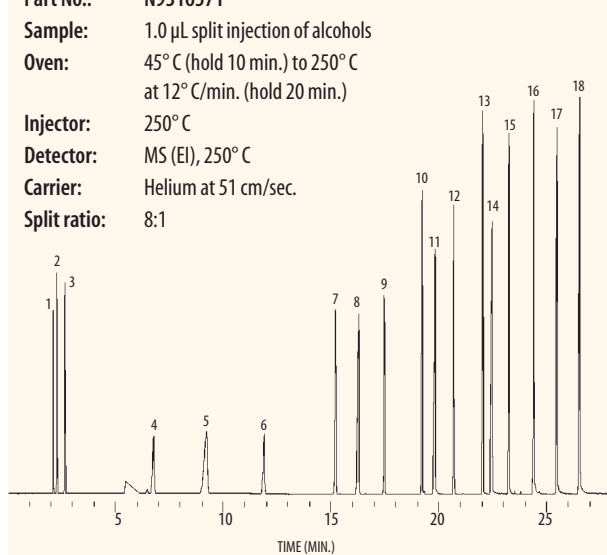
Oven: 45°C (hold 10 min.) to 250°C at 12°C/min. (hold 20 min.)

Injector: 250°C

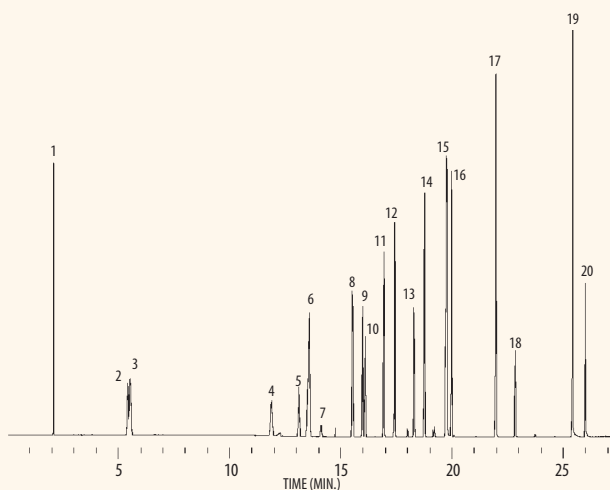
Detector: MS (EI), 250°C

Carrier: Helium at 51 cm/sec.

Split ratio: 8:1



- | | | |
|---------------|-----------------|-----------------|
| 1. pentane | 7. 1-butanol | 13. 1-octanol |
| 2. hexane | 8. dodecane | 14. hexadecane |
| 3. heptane | 9. 1-pentanol | 15. 1-nonanol |
| 4. ethanol | 10. 1-hexanol | 16. 1-decanol |
| 5. decane | 11. tetradecane | 17. 1-undecanol |
| 6. 1-propanol | 12. 1-heptanol | 18. 1-dodecanol |



- | | | |
|--|-----------------------------|---------------------|
| 1. pentane | 8. 1-penten-3-ol | 17. 1-octanol |
| 2. methanol | 9. 2-methoxyethanol | 18. ethylene glycol |
| 3. 2-methyl-2-propanol (tert-butylalcohol) | 10. 2,2,2-trifluoroethanol | 19. 1-undecanol |
| 4. 2-methyl-3-buten-2-ol | 11. 2-ethoxyethanol | 20. 1,4-butanediol |
| 5. 3-buten-2-ol | 12. 1-pentanol | |
| 6. undecane | 13. 2-methyl-1-pentanol | |
| 7. 2,2-dimethyl-1-propanol (neopentanol) | 14. 2,2-dimethyl-1-pentanol | |
| | 15. tetradecane | |
| | 16. trans-2-hexen-1-ol | |

Alcohols

Column: Elite-502.2

105 m, 0.53 mm i.d., 3.0 µm

Part No.: N9316190

Sample: 1.0 µL split injection of an alcohol mixture

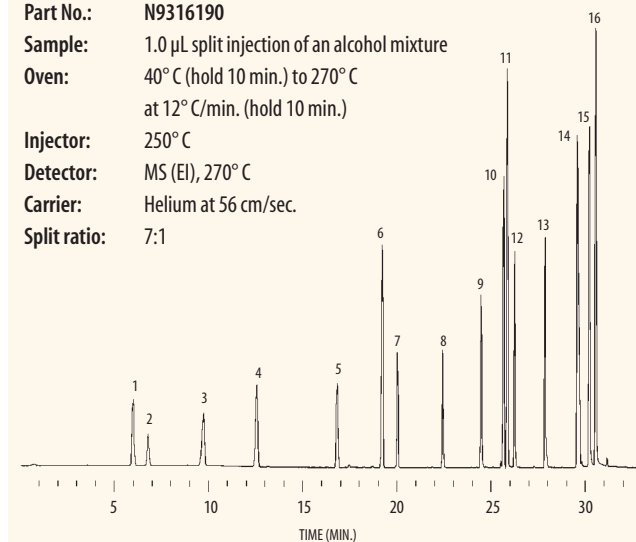
Oven: 40°C (hold 10 min.) to 270°C at 12°C/min. (hold 10 min.)

Injector: 250°C

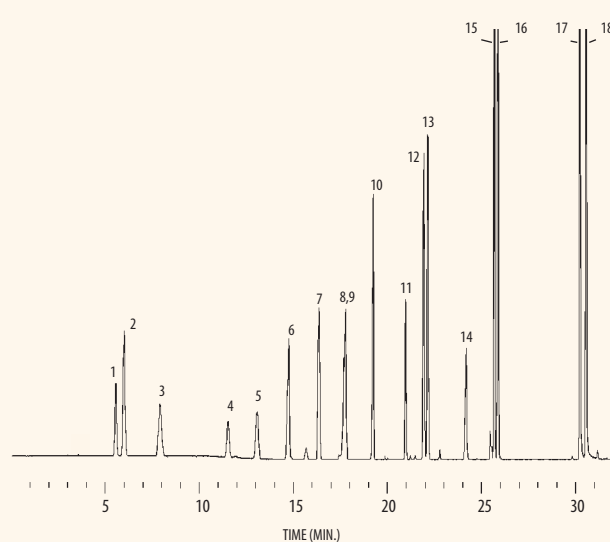
Detector: MS (EI), 270°C

Carrier: Helium at 56 cm/sec.

Split ratio: 7:1



- | | | |
|----------------------|---------------|----------------------|
| 1. pentane | 7. 2-hexanol | 13. 2-decanol |
| 2. isopropyl alcohol | 8. 2-heptanol | 14. 2-phenoxyethanol |
| 3. 2-propen-1-ol | 9. 2-octanol | 15. tetradecane |
| 4. 2-butanol | 10. undecane | 16. 1-undecanol |
| 5. 2-pentanol | 11. 1-octanol | |
| 6. 1-pentanol | 12. 2-nonanol | |



- | | | |
|---------------------------|-------------------------|-----------------------------|
| 1. 2,2,2-trifluoroethanol | 7. 1-penten-3-ol | 13. 2,2-dimethyl-1-pentanol |
| 2. pentane | 8. ethylene glycol | 14. 1,4-butanediol |
| 3. 2-methyl-1-propanol | 9. 2-ethoxyethanol | 15. undecane |
| 4. 3-buten-2-ol | 10. 1-pentanol | 16. 1-octanol |
| 5. 2-methyl-3-buten-2-ol | 11. 2-methyl-1-pentanol | 17. tetradecane |
| 6. 2-methoxyethanol | 12. trans-2-hexen-1-ol | 18. 1-undecanol |

Anabolic Steroids – Underivatized

Column: Elite-5
30 m, 0.25 mm i.d., 0.10 μ m

Part No.: N9316075

Sample: 0.5 μ L split injection of anabolic steroids
Concentration 1000 ng/ μ L

Oven: 180° C to 340° C at 10° C/min. (hold 3 min.)

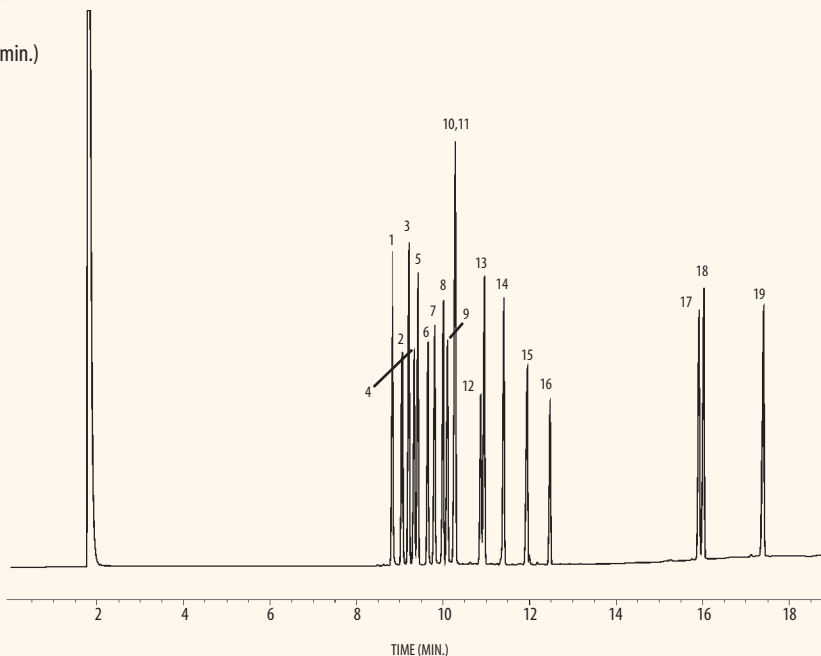
Injector: 280° C

Detector: FID, 340° C

Carrier: Helium at 35 cm/sec.

Split ratio: 50:1

1. 5-androstene-3 β ,17 β -diol
2. 17 α -methyl-5-androstene-3 β ,17 β -diol
3. 5 α -androstan-17 β -ol-3-one
4. 19-nortestosterone
5. 17 α -methylandrostan-17 β -ol-3-one
6. mesterolone
7. testosterone
8. 17 α -methyltestosterone
9. 1-dehydrotestosterone
10. 1-dehydro-17 α -methyltestosterone
11. bolasterone
12. oxymethalone
13. 19-nortestosterone-17-propionate
14. testosterone propionate
15. fluoxymesterone
16. 4-chlorotestosterone-17-acetate
17. testosterone-17 β -cypionate
18. 1-dehydrotestosterone benzoate
19. 1-dehydrotestosterone undecylenate



Cannabinoids – TMS Derivatives

Column: Elite-5
15 m, 0.25 mm i.d., 0.25 μ m

Part No.: N9316073

Sample: 1.0 μ L splitless injection of cannabinoids. Concentration 100 μ g/mL.

Oven: 50° C (hold 0.5 min.) to 225° C at 30° C/min., to 325° C at 10° C/min.

Injector: 225° C

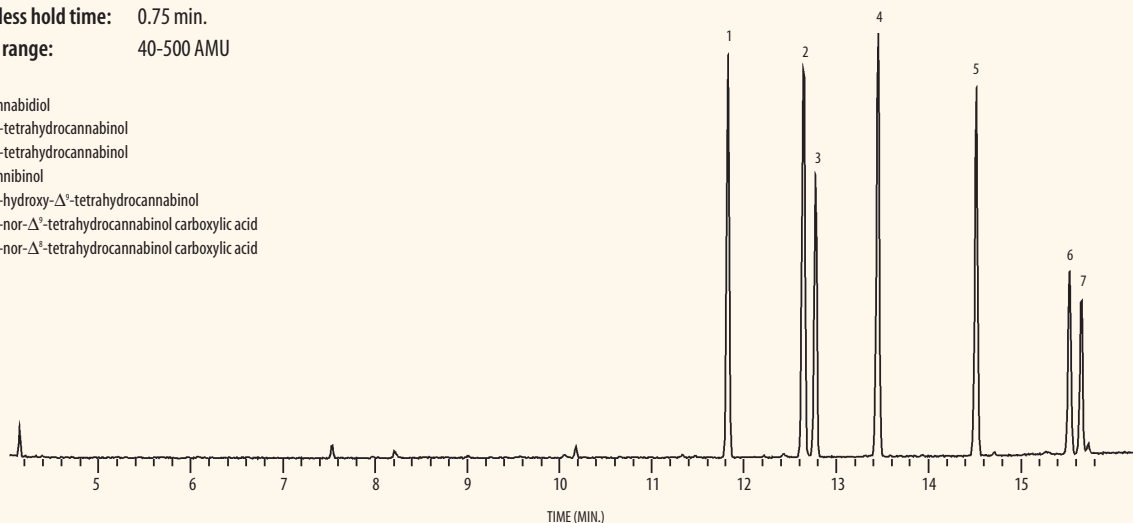
Detector: MS, 320° C

Carrier: Helium at 40 cm/sec.

Splitless hold time: 0.75 min.

Scan range: 40-500 AMU

1. cannabidiol
2. Δ^8 -tetrahydrocannabinol
3. Δ^9 -tetrahydrocannabinol
4. cannibinol
5. 11-hydroxy- Δ^9 -tetrahydrocannabinol
6. 11-nor- Δ^9 -tetrahydrocannabinol carboxylic acid
7. 11-nor- Δ^8 -tetrahydrocannabinol carboxylic acid



Capillary Column Applications

Life Sciences

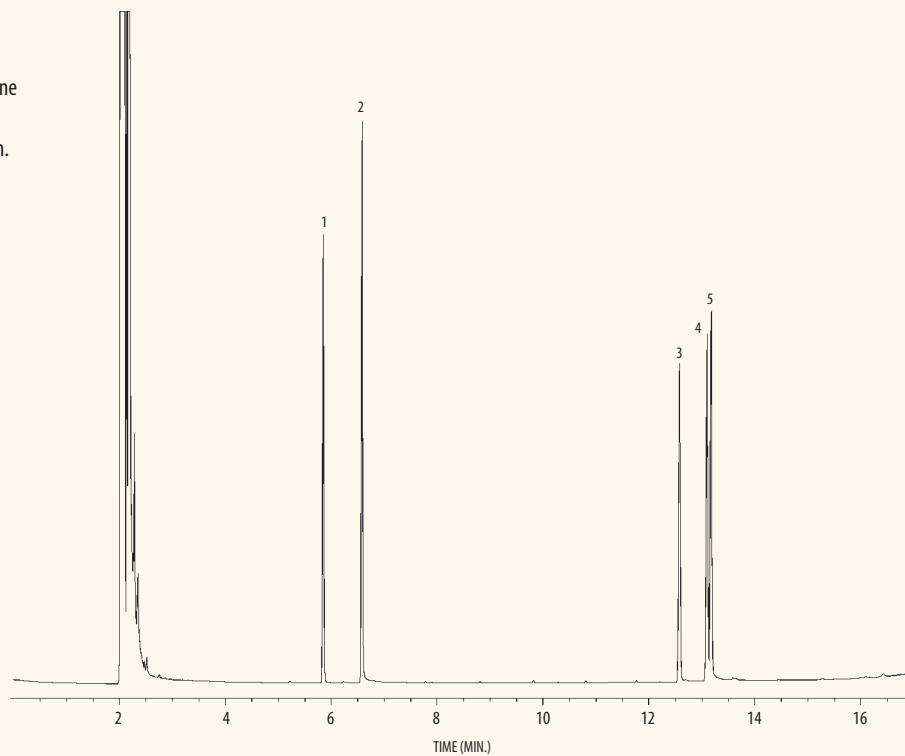
1.800.762.4000 US

GC-78

Cocaine and Metabolites

Column: Elite-5
30 m, 0.25 mm i.d., 0.25 μ m
Part No.: N9316076
Sample: 1.0 μ L split injection of cocaine
and cocaine metabolites
Oven: 150° C to 320° C at 10° C/min.
Injector: 250° C
Detector: FID, 300° C
Carrier: Helium at 30 cm/sec.
Split ratio: 30:1

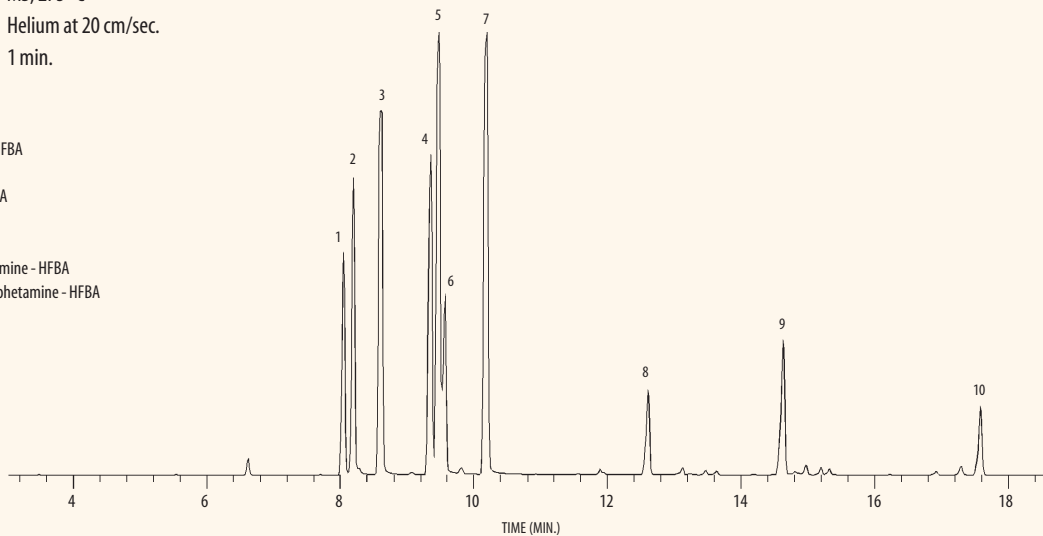
1. ecgonine methyl ester (TMS)
2. ecgonine (TMS)
3. cocaine
4. coca ethylene
5. benzoylecgonine (TMS)



Sympathomimetic Amines – HFBA Derivatives

Column: Elite-5
30 m, 0.25 mm i.d., 0.25 μ m
Part No.: N9316076
Sample: 1.0 μ L splitless injection of sympathomimetic amines
Concentration approximately 2.5 ng/ μ L
Oven: 40° C (hold 1 min.) to 150° C at 30° C/min., to 300° C at 5° C/min.
Injector: 225° C
Detector: MS, 275° C
Carrier: Helium at 20 cm/sec.
Splitless hold time: 1 min.

1. amphetamine - HFBA
2. phentermine - HFBA
3. phenylpropanolamine - HFBA
4. ephedrine - HFBA
5. methamphetamine - HFBA
6. fenfluramine - HFBA
7. pseudoephedrine - HFBA
8. methylenedioxyamphetamine - HFBA
9. methylenedioxymethamphetamine - HFBA
10. methylphenidate - HFBA



Gasoline Range – BTEX

Column: Elite-502.2
105 m, 0.53 mm i.d., 3.0 µm

Part No.: N9316190

Sample: 2500 µL/mL injection of unleaded gasoline
10 µL spiked into 5 mL H₂O

Oven: 40° C (hold 1 min.) to 100° C at 5° C/min.,
to 240° C at 8° C/min. (hold 8 min.)

Injector: 200° C

Detector: FID, 250° C

Carrier: Helium at 10 mL/min.

Trap: Tenax, silica gel, charcoal

Purge: 12 min. at 40 mL/min.

Desorb preheat: 175° C

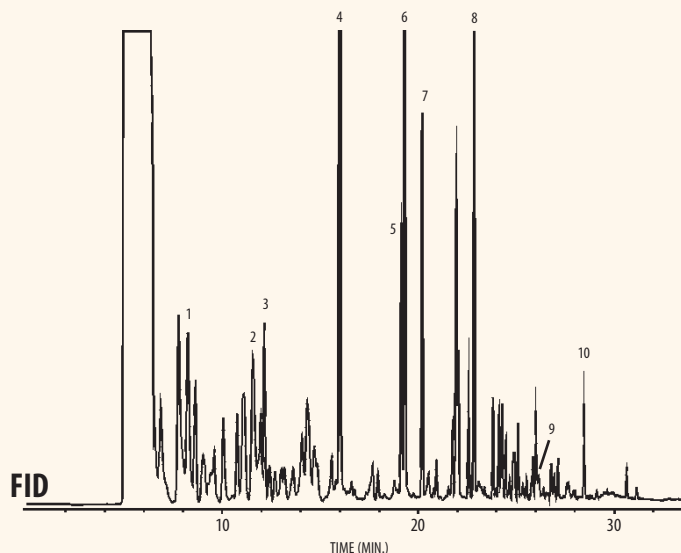
Desorb temp.: 180° C

Desorb time: 2 min.

Desorb flow: 10 mL/min.

Standards used are Unleaded Gasoline Composite Standard:

1. 3-methylpentane
2. 2,2,4-trimethylpentane (isooctane)
3. benzene
4. toluene
5. ethylbenzene
6. *m*-xylene
7. *o*-xylene
8. 1,2,4-trimethylbenzene
9. dodecane
10. naphthalene



Prudhoe Bay Crude Oil

Column: Elite-1
30 m, 0.53 mm i.d., 3.0 µm

Part No.: N9316051

Sample: 0.4 µL split injection of Prudhoe Bay crude oil

Oven: 40° C to 285° C at 5° C/min. (hold 30 min.)

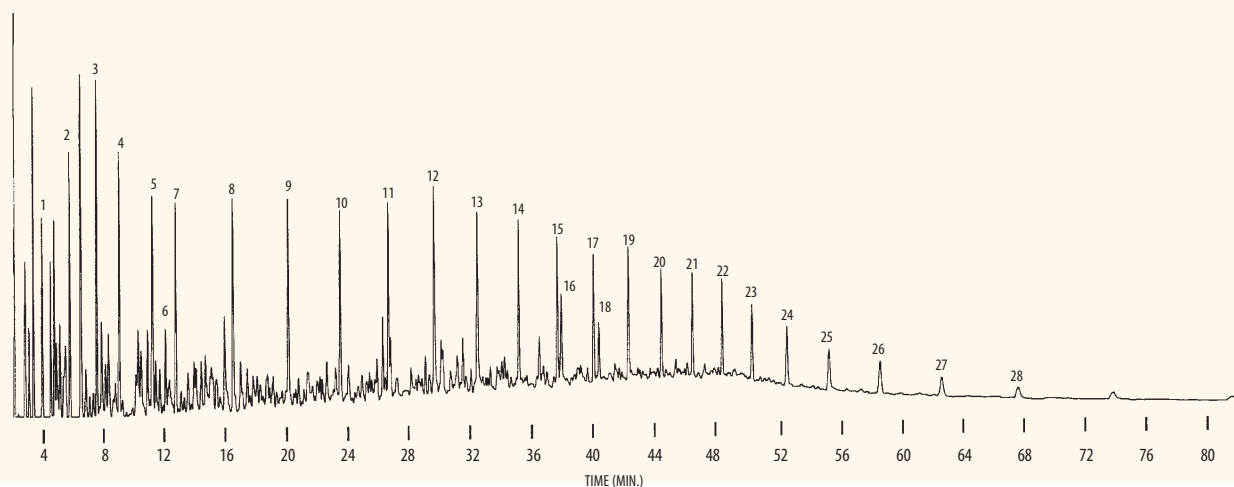
Injector: 285° C

Detector: 285° C

Carrier: Hydrogen at 40 cm/sec.

Split ratio: 50:1

- | | | |
|--|-----------------|-----------------|
| 1. benzene | 11. tridecane | 21. heneicosane |
| 2. heptane | 12. tetradecane | 22. docosane |
| 3. toluene | 13. pentadecane | 23. tricosane |
| 4. octane | 14. hexadecane | 24. tetracosane |
| 5. <i>m</i> -xylene and <i>p</i> -xylene | 15. heptadecane | 25. pentacosane |
| 6. <i>o</i> -xylene | 16. pristane | 26. hexacosane |
| 7. nonane | 17. octadecane | 27. heptacosane |
| 8. decane | 18. phytane | 28. octacosane |
| 9. undecane | 19. nonadecane | |
| 10. dodecane | 20. eicosane | |



Capillary Column Applications

GC-80

Petroleum

1.800.762.4000 US

Volatile Hydrocarbons

Column: Elite-Q PLOT

30 m, 0.32 mm i.d.

Part No.: N9316359

Sample: 300 µL split injection (40:1), 1000 ppm

Oven: 50° C (2 min.) to 220° C at 15° C/min.

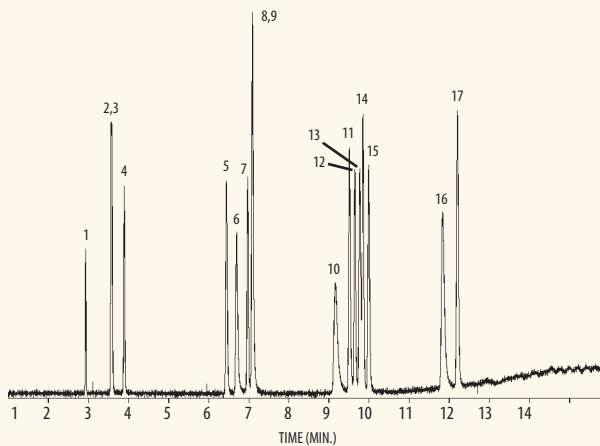
Injector: 250° C

Detector: FID, 250° C

Carrier: Helium at 42 cm/sec.

Split flow: 40 mL/min.

1. methane
2. ethylene
3. acetylene
4. ethane
5. propylene
6. propane
7. cyclopropane
8. propadiene
9. propyne
10. isobutane
11. 1,3-butadiene
12. 1-butene
13. *n*-butane
14. *cis*-2-butene
15. *trans*-2-butene
16. isopentane
17. *n*-pentane



GC Capillary Column Supplies

1.800.561.4646 Canada

GC-81

www.perkinelmer.com/essentials



Uncoated Deactivated Fused-silica Capillary Tubing

High-quality, uncoated fused-silica tubing is available in standard capillary sizes. Deactivated tubing is perfect for making guard columns and retention gaps; available in 5 m lengths. Use our SPLITTERS and CONNECTORS to attach tubing to your polyimide-coated columns.

Polyimide-uncoated Deactivated Tubing

Tube i.d. (mm)	Length	Part No.
0.10	5 m	N9301355
0.18	5 m	N9301354
0.25	5 m	N9301356
0.32	5 m	N9301357
0.53	5 m	N9301358

Capillary Column Support for PerkinElmer GCs

Column supports delicate fused-silica columns in the proper oven location for optimum chromatographic performance.

Description	Part No.
AutoSystem™/AutoSystem XL	N6101070
8000 Series	L4890045

Miscellaneous Column Supplies

Pin Vise and Drill Bits

For enlarging ferrule i.d. for capillary columns. Kit includes a double-ended pin vise and a set of 12 drill bits, sizes No. 61 (0.99 mm) through No. 80 (0.343 mm).

Part No. N9301346



Universal Connectors*

Allows for fast, leak-free connections of fused-silica columns. The new fused-silica tapered design allows connection of any size column and it's easy to use. (0.1 mm to 0.53 mm columns can be used.)

Universal Connector

Part No. N9302149 (pkg. 5)

Universal Y Splitter

Part No. N9303448 (pkg. 1)

Polyimide Sealing Resin

Part No. N9301343 (5 g)

Column Connectors*

Union Connectors*

Column i.d. (mm)	Qty.	Part No.
0.10	pkg. 10	N9301166
0.25	pkg. 10	N9301167
0.32	pkg. 10 pkg. 5	N9301169 N9301170
0.53	pkg. 10 pkg. 5	N9301171 N9301172

Reducing Connectors*

Column i.d. (mm)	Qty.	Part No.
0.32 to 0.25	pkg. 10	N9301338
0.53 to 0.25	pkg. 10	N9301340
0.53 to 0.32	pkg. 10 pkg. 5	N9301342 N9301341

*Note: These connectors are not recommended for use with aluminum-clad columns.



Capillary Column Accessories

1.800.762.4000 US

GC-82

COLUMN ADAPTER KITS

The 0.53 mm Capillary Column Adapter Kit from PerkinElmer contains all the parts necessary to adapt packed column injectors quickly and easily for use with wide-bore capillary columns. For accurate control of the low flows used in wide-bore capillary columns (down to 1 mL/min.), the Flow Control Accessory Kit allows you to modify carrier gas flow controllers (typically used with packed columns). Manual injections can be made either "off" or "on-column" using a 7 cm syringe. For automated injections, or for special Autosampler syringes and needle accessories required for the 0.53 mm adapter, see syringe section for complete listing.

8000 and Sigma Series Adapter Kit Accessories

Flow Accessory Kit (0-10 mL)

Flow accessory contains restrictor required to modify carrier flow controller for low-flow operation.

Part No. N6023031

Capillary Column Detector Receiver

0.8 mm i.d. receiver with 1/16 in. column fitting.

Part No. N6020024

Miscellaneous Wide-bore Kit Replacement Parts

Graphite/Vespel 1/16 in. Ferrule

1/16 in. x 0.8 mm i.d. For connecting capillary columns to adapter liner.

Part No. 09920107 (pkg. 10)

Graphite 1/16 in. Ferrule

1/16 in. x 0.8 mm i.d. For connecting capillary to adapter liner.

Part No. 09920141 (pkg. 10)

Graphite/Vespel 1/4 in. Ferrule

For installing adapter liner into injector.

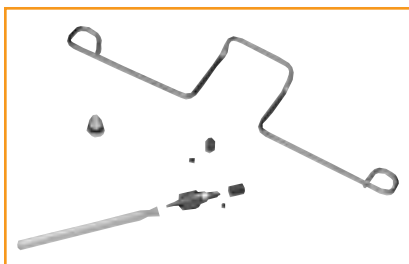
Part No. 09903739 (pkg. 10)

Column Nut 1/16 in.

Replacement 1/16 in. column nut. Connects capillary column to adapter.

Part No. 09903392 (pkg. 5)

AutoSystem™ Series Wide-bore Adapter Kit



AutoSystem GC Adapter Kit

For use in converting the AutoSystem packed column injector to wide-bore capillary operation. Includes 0-20 mL/min. flow controller element, wide-bore adapter with 1/16 in. fitting, wide-bore glass liner and column support hanger. May be used in both on-column or off-column modes. (For AutoSystem GC Series only.)

Part No. N6120001

AutoSystem Series Adapter Kit Accessories

Flow Accessory 0-20 mL

For use when converting an AutoSystem flow controller to low-flow operation.

Part No. N6101377

Flow Accessory 0-100 mL

Shipped as standard with instrument.

Part No. N6102190

Wide-bore Liner

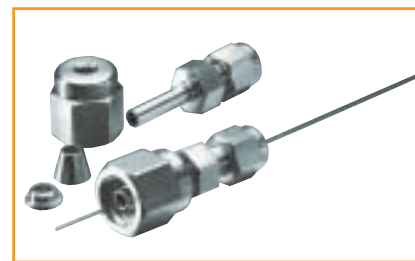
AutoSystem GC wide-bore replacement quartz liner.

Part No. N6121003

Detector Receiver

1/8 in. to 1/16 in. detector receiver for use when using capillary columns with FID, ECD, NPD, and FPD.

Part No. N6120020



Injector/Detector Adapter for Fused-silica Capillary Columns

This 1/8 in. to 1/16 in. stainless steel reducer can be easily installed. For use when installing capillary columns on the 1/8 in. split/splitless injector and all 1/8 in. detector fittings. The reducer allows the use of 1/16 in. graphite/vespel ferrules rather than the larger 1/8 in. ferrule. (Not compatible with AutoSystem Series.)

Part No. N9300063 (pkg. 2)

Wafer Scribe

The ceramic wafer scribe is inexpensive and ideal for cutting polyimide fused-silica capillary columns. The scribe is easy to hold and simple to use. All four sides can be used.

Part No. N9301376 (pkg. 10)












Fittings

1.800.561.4646 Canada

Swagelok™ Fittings

GC-83

www.perkinelmer.com/essentials

		Qty.	Size	Brass Part No.	Stainless Steel Part No.
Front Ferrule		pkg. 5	1/16 in. 1/8 in. 1/4 in.	N9300041 N9300037 N9300031	N9300043 N9300039 N9300033
Back Ferrule		pkg. 5	1/16 in. 1/8 in. 1/4 in.	N9300040 N9300036 N9300030	N9300042 N9300038 N9300032
Nut		pkg. 5	1/16 in. 1/8 in. 1/4 in.	N9300058 N9300056 N9300054	N9300059 N9300057 N9300055
Union		pkg. 2	1/16 in. 1/8 in. 1/4 in.	N9300048 N9300046 N9300044	N9300049 N9300047
Union Tee		pkg. 1	1/16 in. 1/8 in. 1/4 in.	N9301221 N9301222 N9301223	
Reducing Union		pkg. 1	1/8 in. to 1/16 in. 1/4 in. to 1/8 in. 1/4 in. to 1/16 in.	N9300051 N9300050 N9301227	N9301225 N9301226
Plug		pkg. 1	1/16 in. 1/8 in. 1/4 in.	N9300060 N9301268	N9300053 N9300061 N9301233
Male Connector		pkg. 1	1/8 in. to 1/8 in. NPT 1/8 in. to 1/4 in. NPT 1/4 in. to 1/8 in. NPT 1/4 in. to 1/4 in. NPT	N9301253 N9301254 N9301255 N9301269	
Cross Union		pkg. 1	1/8 in.	N9301259	
Male Adapter Tube to Pipe		pkg. 1	1/4 in. tube to 1/8 in. NPT	N9301266	
Bulkhead Adapter		pkg. 1	1/4 in. to 1/4 in. tube		N9301267



Fittings

Graphite, Vespel, and Graphite/Vespel Ferrules

1.800.762.4000 US

GC-84

Graphite

This is the ferrule of choice for high-temperature applications. Of the three ferrule types available graphite is the softest, making it less damaging to capillary columns when overtightened. Graphite seals easily and does not stick to glass columns. Recommended for use with capillary columns. Temperature limit is 450° C.

Graphite/Vespel

Graphite/vespel ferrules (15% graphite/85% polyimide) are recommended for use with GC/MS systems. Best choice for glass columns and polyimide-coated, fused-silica capillary columns. Can usually be removed easily from column. Temperature limit is 350° C.

Vespel

Vespel ferrules are not reusable; they tend to stick to column after use at upper temperature limit. Not recommended for fused-silica capillary columns. Use these vespel ferrules on 1/16 in. metal tubing and glass-lined receivers (heated or ambient). Temperature limit is 350° C.

General Ferrules

Graphite Ferrules

Nut Size (in.)	Ferrule i.d. (in.)	Qty.	Part No.
1/16	1/16	pkg. 10	02450972
1/8	1/8	pkg. 10	09903915
1/4	1/4	pkg. 10	09920140

Graphite/Vespel Ferrules

Nut Size (in.)	Ferrule i.d. (in.)	Qty.	Part No.
1/16	1/16	pkg. 10	09920127
1/8	1/8	pkg. 1	N9302081
1/4	1/4	pkg. 10	09903739

Vespel Packed Stainless Steel Column Ferrules

Nut Size (in.)	Ferrule i.d. (in.)	Qty.	Part No.
1/8	1/8	pkg. 10	N9301360
1/4	1/4	pkg. 10	N9301361

ITD Ferrules

ITD Ferrules for Column Transfer Line

0.4 mm graphite/vespel, 1/16 in.			
Part No.	09920104	(pkg. 10)	
0.32 mm graphite/vespel, 1/16 in.			
Part No.	09920105	(pkg. 10)	
0.53 mm graphite/vespel, 1/16 in.			
Part No.	09920107	(pkg. 10)	

ITD Miscellaneous Ferrules

Graphite/vespel, 1/4 in. x 0.4 mm, transfer line manifold.

Part No. N6212350 (pkg. 1)

Graphite/vespel, 1/4 in., transfer line liner.

Part No. N6212329 (pkg. 1)

Graphite/vespel, 1/8 in., calibration gas line.

Part No. N6212330 (pkg. 1)

TurboMass™/TurboMass Gold Ferrules

Ferrules for Column to Interface Connection

0.4 mm i.d., graphite/vespel, 1/16 in.

Part No. 09920104 (pkg. 10)

0.32 mm i.d., graphite/vespel, 1/16 in.

Part No. 09920105 (pkg. 10)

0.53 mm i.d., graphite/vespel, 1/16 in.

Part No. 09920107 (pkg. 10)

1/16 in. blanking plug (no hole).

Part No. 09920511

Q-Mass 910 Ferrules

Ferrules

0.4 mm graphite/vespel, 1/16 in.

Part No. 09920104 (pkg. 10)

0.32 mm graphite/vespel, 1/16 in.

Part No. 09920105 (pkg. 10)

0.53 mm graphite/vespel, 1/16 in.

Part No. 09920107 (pkg. 10)

1/16 in. graphite/vespel, 1/16 in.

Part No. 09920127 (pkg. 10)

Capillary Column Ferrules

Nut Size (in.)	Column i.d. (mm)	Ferrule i.d. (mm)	Graphite Part No.	Qty.	Graphite/Vespel Part No.	Qty.
1/16	0.18-0.25	0.4	N/A		09920104	pkg. 10
1/16	0.32	0.5	09903700	pkg. 10	09920105	pkg. 10
1/16	0.32	0.5 (2-hole)	N9306001	pkg. 10	N9306000	pkg. 10
1/16	0.53	0.8	09920141	pkg. 10	09920107	pkg. 10
1/16	0.18-0.25	0.4 (2-hole)	N/A		04972392	pkg. 1
1/8	0.53	1.0	09903394	pkg. 10	N/A	
1/8	0.32	0.5 (2-hole)	09903395	pkg. 10	N/A	
1/8	0.32	0.5	09903981	pkg. 10	N/A	

Note: 0.25-0.32 mm i.d. columns require 0.5 mm i.d. ferrules; 0.53 mm i.d. columns require 0.8 mm i.d. ferrules.





Model 9200 Hydrogen Generator

PerkinElmer offers both single- and dual-stage regulators. All regulators are supplied with standard CGA fittings. We recommend that you consult your local gas supplier first to determine the proper tank regulator required. All regulators have an outlet shutoff valve and terminate in a 1/4 in. NPT fitting with male threads.

High-purity Brass Regulators

These regulators are constructed of high-purity brass barstock, and have stainless steel diaphragms and metal-to-metal seals. They are suitable for use with high-purity (>99.995% pure) non-corrosive gases.

Applications:

- High-purity carrier gas
- Most gas chromatography applications

Regulators terminate in a 1/4 in. NPT Swagelok™ fitting.

High-purity Brass Regulator Features:

Barstock Body Construction: Barstock bodies have a lower internal volume than forged bodies, allowing for more complete purging of atmospheric contaminants.

Stainless Steel Diaphragms: Unlike elastomeric diaphragms, stainless steel diaphragms don't adsorb atmospheric contaminants or allow them to diffuse into the gas stream.

Metal-to-metal Seals: Metal-to-metal seals provide reliable protection from inboard leakage of atmospheric contaminants.

Model 9200 Hydrogen Generator

The Model 9200 Hydrogen Generator is perfect for an on-site source of hydrogen for Gas Chromatography. The model 9200 supplies a high-purity hydrogen 99.99% within a flow range 0-250 cc/min STP. The generator is very compact.

Part No. N9301371 (120 V/230 V)

Replacement Cartridge

Part No. N9301373

Safety Straps

Cylinder safety straps hold tanks securely to bench top or wall. Nylon adjustable straps are easy to use and safe.

Part No. N9301298 (wall mount)

Part No. N9301299 (bench mount)

Gas Supply Installation Kit

Kit includes hardware to hook up three gas supplies to gas chromatograph. Kit includes: (1) safety gas flow restrictor for hydrogen (00090038), (1) restrictor warning tag (00091216), (1) restrictor tag (00091360), (50 ft.) 1/8 in. precleaned copper tubing (N9300077), (6) 1/8 in. Swagelok nut (09903128), (6) 1/8 in. brass front ferrules (09903129), (6) 1/8 in. brass rear ferrules (09903130), (3) 1/8 in. Swagelok brass 3-way tee (09903170), (3) 1/4 in. NPT x 1/8 in. Swagelok adapter (09903795), (1) 1/4 in. NPT x 1/8 in. NPT reducer female (09903212), (1) 1/15 in. x 1/2 in. open-end wrench (09907266), and (1) 6 in. adjustable wrench.

Part No. 03328000



High-purity Brass Regulators (Single Stage)

CGA Fitting	Delivery Pressure Use	Delivery Pressure Range (psig)	Cylinder Pressure Gauge (psig)	Gauge (psig)	Part No.
CGA-590	Air	5-180	0-250	0-3000	00230090
CGA-350	He, Ar	10-180	0-250	0-3000	00230253
CGA-350	H ₂ and Ar/CH ₄ mixes	3-80	0-100	0-3000	00230091

High-purity Brass Regulators (Dual Stage)

CGA Fitting	Delivery Pressure Use	Delivery Pressure Range (psig)	Cylinder Pressure Gauge (psig)	Gauge (psig)	Part No.
CGA-580	He, Ar	4-100	0-250	0-3000	09907127
CGA-350	H ₂ and Ar/CH ₄ mixes	4-100	0-250	0-3000	09907128



Tools

Deluxe Tool Kit

Great for use on all lab instruments! Kit includes the following tools: open-end wrench set (6 pc.), screwdriver set (6 pc.), adjustable wrench (6 in.), chain nose pliers (narrow), wire cutters, wire strippers, slip-joint pliers (6 in.), long nose No. 5 stainless steel tweezers (4 3/8 in.), needle file set (6 pc.), Allen key set (11 pc. imperial sizes), and Allen key set (9 pc. metric sizes). Shipped in a plastic tool box for convenient storage.

Part No. N9301328

Basic Tool Kit

Tools come in tool box for easy storage and use. Kit includes: open-end wrench set (6 pc), screwdriver set (6 pc.), adjustable wrench (6 in.), chain nose pliers (narrow), wire cutters, and wire strippers.

Part No. N9301327

6-Piece, Open-end Wrench Set

Six sizes. Includes: 1/4 in. x 5/16 in., 5/16 in. x 3/8 in., 3/8 in. x 1/16 in., 7/16 in. x 1/2 in., 1/2 in. x 9/16 in., 9/16 in. x 5/8 in.

Part No. N9301325

Adjustable Wrench

Adjustable 12 in. steel wrench for cylinder pressure regulators. Wrench opens out to 1 3/4 in. Fits all regulators listed in this catalog.

Part No. N9301324

Snoop Leak Detector Solution

8 oz. bottle.

Part No. N9301329

Flow Meters

Digital Flow Meter

The PerkinElmer Model 570 meets ISO 9000 and Good Laboratory Practice (GLP) requirements. The flow meter comes with a "Certificate of Calibration" that states all of the traceability information needed for ISO-9000 compliance. The Model 570 is uniquely identified by serial number, internal instrument number, and date(s) of calibration. It is also capable of periodic recalibration.

Part No. N9302974

Replacement Glass for Digital Flow Meter

Part No. N9303429

PerkinElmer Electronic Flowmeter 1000

- Flow range 0.1-1000 mL/min.
- Operating Temperature 0 to 45° C
- Traceable to NIST Primary Standard
- Split Ratio Mode
- Accuracy \pm -3%
- LCD Alphanumeric Display

The PerkinElmer Flowmeter 1000 allows for rapid real-time flow measurements. Flow rates measured in mL/min. (volumetric flow). The PerkinElmer Flowmeter 1000 can quickly calculate split ratios. Ratios are displayed in real time. Flowmeter not compatible with corrosive or flammable gases. Portable operation. (9 V battery included).

Part No. N9307029

Soap Bubble Flow Meters

The glass soap bubble flow meters are calibrated in 1 mL and 10 mL two-stage or 1 mL, 10 mL, and 100 mL three-stage for easy flow reading. Bubble meters come complete with liquid soap, rubber squeeze bulb, miscellaneous-sized plastic tube pieces to adapt to various fittings, and instructions (stand required but not included – N9303314).

Two-stage

Part No. 00230522

Three-stage

Part No. N9300081

Stand

Part No. N9303314

Tubing

Description	Qty.	Part No.
Precleaned Copper Tubing	50 ft.	N9300077
Teflon® Tubing, 1/8 in. o.d.	1 ft.	02506483
Yellow Polyethylene for Autosampler Lines	1 ft.	02505799
Teflon Tubing, 1/16 in. o.d. Hall Solvent Lines	1 ft.	09985708
Brown Polyethylene for Autosampler Carrier Gas Lines	1 ft.	02505798
Tygon Tubing 1/4 in. i.d., 3/8 in. o.d. for Water and Air (not for carrier gas)	1 ft.	02506518

AUTOSYSTEM™ GC VIALS, CAPS, SEPTA

Autosampler Vials, Caps, Septa

Vial for use with AS-100, 100B, 300, 8300, and AI-1* Crimp Top Vial

0.8 mL volume (8 mm) vial. Caps and septa not included.

Part No. N9301069 (pkg. 200)

Crimp Caps and Septa

For use with (8 mm) 0.8 mL and 0.25 mL vials. PTFE natural rubber septa.

Part No. 03300806 (pkg. 1000)

*Adapter Required

AutoSystem GC Crimp Top Sample Vials



Clear (11 mm) sample vial, 2 mL volume. Caps and septa not included.

Part No. N9301385 (pkg. 100)

Amber (11 mm) vial for photosensitive samples, 2 mL volume. Caps and septa not included.

Part No. N9302680 (pkg. 100)

AutoSystem GC Low-volume Sample Inserts

Low volume glass inserts for use with AutoSystem GC crimp cap sample vials. Supports required but not included.

Insert

Part No. N9302681 (pkg. 1000)

Support

Part No. N9302682 (pkg. 500)

AutoSystem GC Crimp Caps and Septa

Aluminum crimp caps and septa for AutoSystem GC, 11 mm sample vial, Teflon®/rubber.

Silver Crimp Caps

Silver crimp caps and septa.

Part No. N9306015 (pkg. 100)

Color Crimp Caps

Green crimp caps and septa.

Part No. N9302684 (pkg. 100)

Red crimp caps and septa.

Part No. N9302685 (pkg. 100)

Blue crimp caps and septa.

Part No. N9302686 (pkg. 100)



Viton® Septa Crimp Caps

These Viton septa caps are recommended for applications that require work with chloroform. For use with AutoSystem GC 11 mm crimp top sample vials.

Part No. N9302784 (pkg. 1000)

AutoSystem GC Screw Top Sample Vials

These vials are custom designed for the AutoSystem GC and tested for exclusive use in the AutoSystem GC. (Not to be used with low-volume insert.)

Vial, Screw Top

Part No. N9302945 (pkg. 100)

Cap, for Screw Top Vial

Part No. N9303441 (pkg. 100)

Septa for Screw Top Cap

PTFE-coated butyl rubber.

Part No. N9303442 (pkg. 100)

Vial Accessories

Hand Crimpers

6.0 mL and 20.0 mL (headspace vials), 20 mm.

Part No. N9302785

1.5 mL (AutoSystem GC sample vials), 11 mm.

Part No. 00090699

Bench Top Crimper

Sturdy, rugged stand will accept three size jaws. Jaws required but not included.

Part No. N6621006

Jaws for Bench Top Crimpers

Headspace vials, 20 mm.

Part No. N6621009

AutoSystem GC vials, 11 mm.

Part No. N6621008

Economy Cap Removal Tool

20 mm

Part No. N9301270

11 mm

Part No. N9301390

Vial Holder Racks

Keep your samples organized and tip proof! These rugged, plastic vial racks are great for holding vials while you load and cap your samples. They stack away neatly when done.

50 vial capacity, 11 mm.

Part No. N9301303

36 vial capacity, 20 mm.

Part No. N9301304

AutoSystem GC Waste and Wash Vials and Caps

Clear Waste and Wash Vial

4 mL (15 mm).

Part No. 09923031 (pkg. 1)

Cap for Waste and Wash Vials

(15 mm).

Part No. 09923032 (pkg. 1)

Septa for Waste Wash Vials

For use with viscous or toxic samples.

Part No. N9302780 (pkg. 50)

Diffusers for Waste and Wash Vials

Part No. N6101276 (pkg. 1)

Diffusers are sold exclusively by PerkinElmer.

The conical shape allows the needle to penetrate into solvent or waste. Reduces spillage and large losses through evaporation.

Why a 7 cm Needle?

All PerkinElmer injectors have been tested and optimized for use with a 7 cm needle. A 7 cm needle is critical to be sure your sample is deposited in the optimal zone.

Removable Needle Syringes (RN)

Syringe Capacity	Point Style #2 Part No.
10 µL	N9302210*
25 µL	N9302211
50 µL	N9302212
100 µL	N9302213
250 µL	N9302214
500 µL	N9302215

*Standard syringe but fitted with 7 cm needle for PerkinElmer injectors.

Replacement Needles for Removable Needle Syringes (RN)

Syringe Capacity	Gauge	Length	Qty.	Point Style #2 Part No.
10 µL	265	7 cm*	pkg. 3	N9302220
10 µL	265	2 in.	pkg. 3	N9302222
25 µL	225	2 in.	pkg. 3	N9302224
50 µL	225	2 in.	pkg. 3	N9302224
100 µL	225	2 in.	pkg. 3	N9302226
500 µL	22	2 in.	pkg. 3	N9302228

*Recommended for PerkinElmer injectors.

Fixed Needle Syringes

Syringe Capacity	Point Style #2 Part No.	Point Style #3 Part No.
10 µL	00230113	
10 µL	00230523*	
25 µL	N9302202	09904823
50 µL	N9302203	09904941
100 µL	N9302204	09904822

*Standard syringe but fitted with 7 cm needle for PerkinElmer injectors.

Syringe Six Pack

Contains six syringes (10 µL, fixed needle, point style #2, 00230523). Fitted with 7 cm needle for use with all PerkinElmer injectors. Buy by the pack and save!

Part No. N9302230

Needle Types

Point Style 2

General-purpose point style designed for septum penetration in all chromatographic techniques. The needle has a 22° bevel with the tip slightly bent to minimize coring and needle plugging.



Point Style 3

Needle has a 90° bevel. Point style 3 is recommended when the syringe is used for accurate pipetting of liquids. Excellent for mixing standards of very small volume.



Note: For Autosampler syringes, see corresponding Autosampler page.

Replacement Needles for Removable Needle Gas Tight Syringes (RN)

Needle Gauge	Volume	Part No.
265	10 µL	N9302222
225	25, 50, 100 µL	N9302224
225	250 µL	N9302226
22	50 µL - 10 mL	N9302228

Ultramicro Volume Syringes

Recommended for liquid sample injections of less than 5 µL for gas chromatography. Syringes come standard with needle length of 7 cm – optimum for PerkinElmer injectors.

Syringe Capacity	Needle Gauge	Syringe Part No.
0.5 µL	25	N9302231
1.0 µL	26*	00230111
1.0 µL	22	00230177
2.0 µL	25	N9302235
2.0 µL	23	N9302237
5.0 µL	24	00230178

*Recommended for PerkinElmer Wide-bore Capillary Adapter.

Gas Tight Syringes

Syringe Capacity	Fixed Needle (N) Part No.	Removable Needle (RN) Part No.
10 µL	N9302240	N9302241
25 µL	N9302242	N9302243
50 µL	N9302244	N9302245
100 µL	N9302247	
250 µL	N9302250	N9302251
500 µL	N9302253	N9302254
1.0 mL	N9302256	N9302257
2.5 mL	N9302259	
5.0 mL	N9302262	
10 mL	N9302265	N9302266



10 mL Gas Tight Syringe

AutoSystem™ Autosampler Syringes

Description	Volume/O.D.	Syringe Part No.	Replacement Needle Part No.
Metal plunger in barrel type	50 µL/0.63	N6101760	
Routine analysis. Shipped standard.	5 µL/0.63	N6101390	
Plunger metal plunger in barrel with Teflon®-tipped seal.			
Routine analysis, plunger type: metal plunger in barrel.	5 µL/0.63	N6101251	
0.53 capillary column on-column injection.	5 µL/0.47	N6101380	
Plunger type: metal plunger in barrel.			
Low injection volume analysis.	0.5 µL/0.63	N6101252	N6101469
Plunger type: metal plunger in needle.			
Low injection volume. 0.53 capillary on-column injection.	5 µL/0.47	N6101253	N6101470
Plunger type: metal plunger in needle.			

Note: For more accessories for the AutoSystem Autosampler. See page GC-20.



Hydrocarbon Trap

Use our activated charcoal in-line trap to remove gaseous hydrocarbons from carrier gas supply. This trap will remove all hydrocarbons at room temperature except methane. Essential for purge and trap systems, or high-sensitivity FID operation when contamination is a problem. Maximum pressure 1000 psig. Frits at the end prevent any particles from entering the gas stream. Trap is purged with nitrogen and should be purged with the gas you plan to use. Approximate dimensions: 2 in. W x 14 in. H with 1/8 in. fittings.

Part No. N9301192



Gas In-line Filter

This in-line filter removes moisture, oil, and particulate from gas supplies. Large capacity filter requires fewer filter changes, and improves baseline stability and chromatographic results. Free-standing model also available. Maximum pressure 100 psig. Trap packing can be refilled. Approximate dimensions: 2 1/4 in. W x 17 in. H with 1/8 in. fittings.

In-line gas filter.

Part No. N9301178

Base-mount filter.

Part No. N9301177

Packing refill kit (sufficient for two refills).

Part No. N9301176



Note: All gases must have a minimum purity of 99.995%. Gases for either ELCD or mass spectrometer MUST have a minimum purity of 99.999%.



Safe Glass Moisture Trap

In-line moisture trap. Drierite indicating agent and Molecular Sieve 5A are packed in glass which is enclosed in a safety plastic tube in the event the glass breaks. Unique loading design allows operation in any orientation without channeling. For use with pressures up to 100 psig. Designed for use with GC detectors that require high-purity gases. Recommended for ELCD and ECD systems in which moisture and contamination are a problem. Trap is shipped active and purged with nitrogen. It is recommended that you purge the trap with the gas you plan to use. Approximate dimensions: 1 3/8 in. W x 10 1/4 in. H with 1/8 in. end fittings.

Part No. N9301193



Indicating Oxygen Trap

Indicating trap has a capacity of 40 cc of pure oxygen. The trap has a maximum pressure of 100 psig. The trap is shipped in the active state purged with hydrogen. It is recommended that you purge the trap with the gas you will be using. Approximate dimensions: 1 3/8 in. x 10 1/4 in. Includes 1/8 in. fittings. It is recommended that the indicating trap be used downstream of the high-capacity oxygen trap.

Part No. N9301191



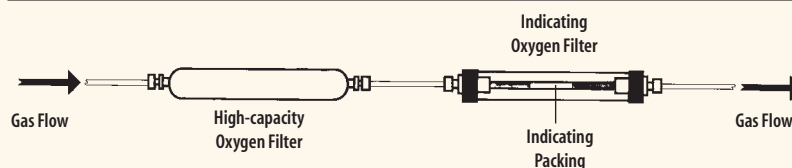
Oxygen Trap

High efficiency oxygen trap has a capacity of 2.5 liters at room temperature. It is also effective for removing sulphur compounds such as hydrogen sulfide and mercaptans. This oxygen trap is for use with nonoxidizing gases such as; He, Ar, N₂, and CH₄. Oxygen removal to below 70 ppb using normal GC flow rates. The catalyst is a copper-based material that forms copper oxide in the presence of oxygen; no gas is produced from this reaction. This trap is intended for use with gases containing less than 1% oxygen. The trap is delivered active purged with nitrogen. (Purging with the gas you will be using is recommended.) Maximum pressure 1000 psig. Approximate dimensions: 2 in. x 14 in. including fitting end; fittings are 1/8 in.

Part No. N9301179

Recommended Filters

Detector	Carrier Gas	H ₂	Air
FID	Hydrocarbon Trap Oxygen Trap if capillary columns are used	Moisture Trap	Moisture Trap
NPD	Hydrocarbon Trap Oxygen Trap if capillary columns are used	Moisture Trap	Moisture Trap
FPD	Hydrocarbon Trap Oxygen Trap if capillary columns are used	Moisture Trap	Moisture Trap
TCD	Hydrocarbon Trap Oxygen Trap if capillary columns are used		
ECD	Moisture Trap and Oxygen Trap		
PID	Hydrocarbon Trap Oxygen Trap if capillary columns are used		
ELCD	Hydrocarbon Trap Oxygen Trap if capillary columns are used	Hydrocarbon Trap	
MS	Indicating Oxygen Trap		



Filters and Traps

The Gas Purification System

1.800.762.4000 US

- Cartridges are easy to replace
- High capacity
- Wall bracket gets the system up and out of the way

This system will provide in-line contaminant removal for your GC gases. This system has convenient replaceable cartridges with a visual indicator. The PerkinElmer Gas system consists of three cartridges in series to reduce column damaging impurities. The first cartridge in the system will remove residual hydrocarbons and water from the carrier gas stream. The second cartridge provides high-capacity oxygen removal (capacity is at least 1000 cc of pure oxygen); the third cartridge contains an inorganic indicator that changes from light green to gray to provide warning when the high-capacity oxygen trap is depleted. All systems are helium leak tested after assembly. Approximate dimensions: 33 cm W x 33 cm H x 8 cm D; weight 4 kg. (For more information, please call and ask for literature piece No. L-1785.) See table below for part number information.

The All-In-One Gas Purification System

The trace contaminant removal available from the three-cartridge Gas Purification System is now available in a single-cartridge system. The purifier consists of a manifold head and an all-welded steel cartridge with a multiple-layer adsorbent bed to sequentially remove water, oxygen, sulfur compounds, and hydrocarbons. The All-In-One Gas Purification System has a capacity for oxygen of at least 450 cc, enough to purify eight 292 cu. ft. tanks of 99.995% pure helium. Water capacity is at least 1.7 g, while capacity for hydrocarbons (as n-butane) is 5.2 g. The system comes ready to wall mount, but may be bench-mounted by removing from the bracket and attaching to a bench-mount base (included). It is shipped fully activated and filled with high-purity helium.

All-In-One Gas Purification System with Trap, 1/8 in. Fittings

Part No. N9306050

Replacement Cartridge

Part No. N9306051



Gas Purification System

Gas Purification System

1/8 in. fittings complete system (includes all three traps).

Part No. N9306002

Hydrocarbon Moisture Replacement Cartridge

Part No. N9306003

High-capacity Oxygen Replacement Cartridge

Part No. N9306004

Indicating Oxygen Replacement Cartridge

Part No. N9306005

Replacement Cartridge Set

One each hydrocarbon/moisture, high-capacity oxygen, and indicating oxygen.

Part No. N9306048

Bypass Accessory

Allows operation of system when installed in place of cartridge.

Part No. N9306006

Bench Mount Adapter

Part No. N9306014



1.800.561.4646 Canada

There are two types of valves offered. Internal Volume sample size is determined by an etched rotor inside the valve.

External Volume sample size is determined by a sample loop outside the valve.

External valves are used primarily for sample injection and or switching applications. A valve used for just switching requires another valve for sample injection. Valves include nuts and ferrules but not loops.



3-Port Valve

Requires 90° actuator and standoff for automatic operation.

Rotation	Max. Temp.	Max. Pressure	Fitting (in.)	Valve Part No.
90°	330° C	300 psi	1/16	N9302885

4-Port Valve

Requires 60° actuator and standoff for automatic operation.

Rotation	Max. Temp.	Max. Pressure	Fitting (in.)	Valve Part No.
90°	175° C	400 psi	1/16	N9302809
90°	350° C	300 psi	1/16	N9302813
90°	330° C	300 psi	1/8	N9302817

6-Port Valve

Requires 60° actuator and standoff for automatic operation.

Rotation	Max. Temp.	Max. Pressure	Fitting (in.)	Valve Part No.	Replacement Rotor Part No.
60°	175° C	400 psi	1/16	N9302810	N9302897
60°	350° C	300 psi	1/16	N9302814	N9302901
60°	330° C	300 psi	1/8	N9302818	N9302905

8-Port Valve

Requires 45° actuator and standoff for automatic operation.

Rotation	Max. Temp.	Max. Pressure	Fitting (in.)	Valve Part No.
45°	175° C	400 psi	1/16	N9302811
45°	350° C	300 psi	1/16	N9302815
45°	330° C	300 psi	1/8	N9302819

10-Port Valve

Requires 36° actuator and standoff for automatic operation.

Rotation	Max. Temp.	Max. Pressure	Fitting (in.)	Valve Part No.	Replacement Rotor Part No.
36°	175° C	400 psi	1/16	N9302812	N9302899
36°	350° C	300 psi	1/16	N9302816	N9302903
36°	330° C	300 psi	1/8	N9302820*	

*Special 4 1/8 in. standoff included.

INTERNAL VOLUME VALVE FOR LIQUID SAMPLE INJECTORS

4-Port Internal Valve and Rotor

Fixed Volume (µL)	Fitting Size	Port Diameter	Valve Part No.	Replacement Rotor Part No.
0.06	1/16 in.	0.016	N9302800	N9302887
0.2	1/16 in.	0.016	N9302802	N9302889
0.5	1/16 in.	0.016	N9302803	N9302890
2.0	1/8 in.	0.030	N9302808	N9302895

Max. Temp. = 75° C, Max. Pressure = 500 psi, Fitting Size – 1/16 in. These valves require a 90° actuator and standoff for automatic operation.



Sample Loops

Volume	Fitting Size	6-Port Part No.	8-Port Part No.	10-Port Part No.
100 µL	1/16 in.	N9302851	N9302854	N9302857
250 µL	1/16 in.	N9302852	N9302855	N9302858
500 µL	1/16 in.	N9302853	N/A	N9302859
100 µL	1/8 in.	N9302860	N/A	N9302866
250 µL	1/8 in.	N/A	N/A	N9302867
500 µL	1/8 in.	N9302862	N/A	N9302868
1 mL	1/16 in.	N9302950	N9302953	N9302956
2 mL	1/16 in.	N9302951	N9302954	N9302957
5 mL	1/16 in.	N9302952	N9302955	N9302958
1 mL	1/8 in.	N9302959	N9302962	N9302965
2 mL	1/8 in.	N9302960	N/A	N9302966
5 mL	1/8 in.	N9302961	N/A	N9302967

1/8 in. fitting loop for valves with 0.030 in. standard port diameter. 1/16 in. fitting loop for valves with 0.016 in. standard port diameter.



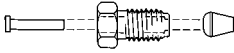



Tubing Kits

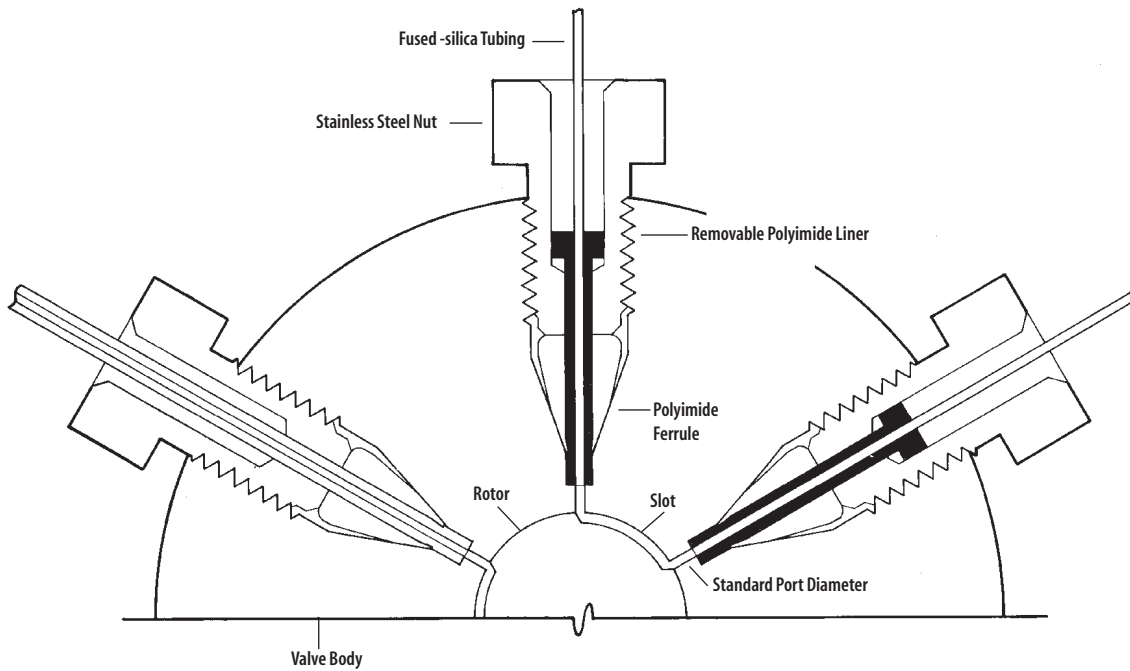
Particulate contamination is the leading cause of valve failure. This tubing has been washed and precleaned, with solvent and microfiltered steam from deionized water to remove organic and ionic particulate contamination. Each kit contains two pieces of 1/16 in. o.d. S/S tubing.

Length	0.02 in. Part No.
20 cm	N9302871
30 cm	N9302872
50 cm	N9302922
125 cm	N9300087

Fused-silica Adapters

These adapters allow connection of fused-silica to unions, valve ports, and reducers.

Description	i.d.	Column i.d.	Fitting	Part No.
	0.5 mm 0.6-0.8 mm	0.18 mm-0.35 mm 0.53 mm	1/16 in. 1/16 in.	N9302846 N9302847
		any	1/16 in.	N9302850
	0.5 mm 0.6-0.8 mm	0.18 mm-0.35 mm 0.53 mm	1/16 in. 1/16 in.	N9302848 N9302849
		any	1/16 in.	N9302886



Gas Sampling Valves

1.800.762.4000 US

GC-94

Accessories for the AutoSystem™ GC

Solenoid Kit

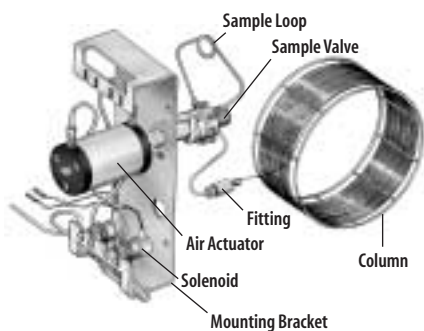
Kit is required for each air actuator. Solenoid Kit allows precise pulse of air needed to drive air actuator. Kit includes instructions. For use with AutoSystem GC only.

Part No. N6120032

Mounting Kit

Kit includes all necessary hardware to install valves on AutoSystem GC. Each kit is capable of mounting up to two gas valves inside the oven. Includes detailed instructions that show how to use gas valves, set up timed events, and configure the AutoSystem GC software.

Part No. N6120033



Air Actuators

For Use With	Degree Rotation	Part No.
3- and 4-port valves	90°	N9302882
6-port valves	60°	N9302881
8-port valves	45°	N9302825
10-port valves	36°	N9302827

Air Actuator Extension Kit

Extension screw allows easy tightening of the air actuator to the standoff. Required on AutoSystem GC.

Part No. N9300088

Angle Bracket

General purpose bracket for mounting standoff and actuators.

Part No. N9300090

Restrictor

At ambient conditions flows range from 2-200 mL/min. (inlet at 15 psi). Includes stainless steel lines (18 in. long, 1/16 in. o.d., 0.020 in. i.d.) and inlet filter.

Part No. N9302823

Actuator Knob

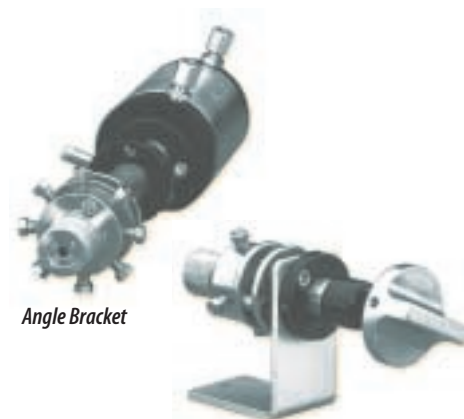
Manual knob allows manual switching of valves. Can be used with any valve or standoff listed except closemount assembly.

Part No. N9302913

Rotor Removal Tool

Magnet end allows easy removal of rotor from valves.

Part No. N9302914



Angle Bracket

Actuator Knob



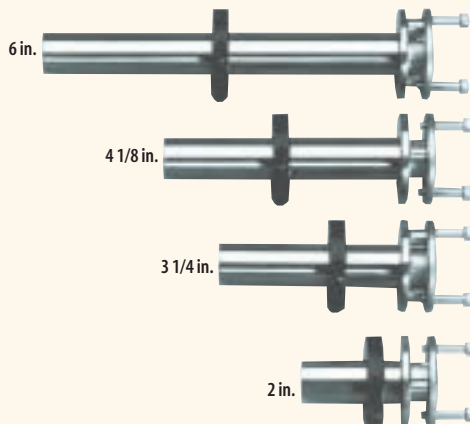
Rotor Removal Tool

Restrictor

Standoffs

A standoff supports both the actuator and the valve. The standoff places the valve at the specific distance from the actuator. A 4 1/8 in. standoff is recommended for mounting valves in PerkinElmer GC ovens. Standoff and actuator sold separately.

Length	Part No.
6 in.	N9302912
4 1/8 in.	N9302911
3 1/4 in.	N9302910
2 in.	N9302909



Special Standoff for 10-Port Valve

This standoff will allow connection of a 10-port 1/8 in. valve to the AutoSystem GC.

Part No. N9302781

Closemount Assembly

Allows close mounting of actuator and valve. Primarily used for mounting valve outside oven. (Not to be used with manual actuator knobs.)

Part No. N9302908



Closemount

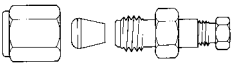
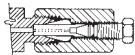






Starter Kit

Includes parts useful for valve plumbing. Excellent for 1/16 in. valves.

Part No. N9302821

The Starter Kit (N9302821) contains the following items:

	Description	Use	Qty.	Part No.
	Reducer 1/8 in. Swagelok™ to 1/16 in. Valco	Packed Column Adapter	pkg. 4	N9302917
	Reducer 1/8 in. Swagelok male nut to 1/16 in. Valco	Injector/Detector Adapter	pkg. 2	N9302844
	Valco nut 1/16 in.*		pkg. 6	N9302832
	Valco Ferrule 1/16 in.		pkg. 10	N9302835
	1/16 in. Filter Union with Removable Screen	Gas Line Filter	pkg. 1	N9302879
 (actual size)	2 μ Screen Filter	Replacement Filters for N9302879	pkg. 6	N9302880
Stainless Steel Tubing	50 cm 1/16 in. o.d. 0.02 in. i.d.	Carrier to Detector	pkg. 2	N9302922
	125 cm 1/16 in. o.d. 0.02 in. i.d.	Sample Input/Output	pkg. 2	N9300087

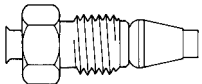
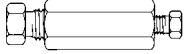
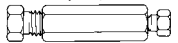
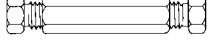
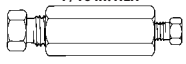
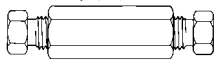
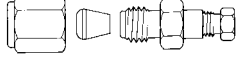



*Cannot be used with fused-silica adapters N9302846 or N9302847.



GSV Fittings

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Plugs and Caps	Description	Qty.	Part No.
	1/16 in. plug	pkg. 1	N9302918
	1/8 in. plug	pkg. 1	N9302919
	1/16 in. cap	pkg. 1	N9302920
	1/8 in. cap	pkg. 1	N9302921
Unions	Description	Qty.	Part No.
 1/4 in. HEX	1/16 in. to 1/32 in. reducing union	pkg. 1	N9302838
 1/4 in. HEX	1/16 in. union	pkg. 1	N9302839
 7/16 in. HEX	1/8 in. 1/16 in. reducing union	pkg. 1	N9302840
 7/16 in. HEX	1/8 in. union	pkg. 1	N9302841
Reducers	Description	Qty.	Part No.
 3/8 in. HEX	1/8 in. Swagelok™ to 1/16 in. Valco	pkg. 1	N9302917
 1/4 in. HEX	1/16 in. adapter for 1/16 in. port	pkg. 1	N9302843
Standard Nuts	Description	Qty.	Part No.
	1/16 in.	pkg. 1	N9302832
	1/8 in.	pkg. 1	N9302833
Ferrules	Description	Qty.	Part No.
	1/16 in. stainless steel	pkg. 1	N9302835
	1/8 in. stainless steel	pkg. 1	N9302836

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Instrument Pneumatics Accessories

1.800.561.4646 Canada

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Carrier and Combustion Gas Pneumatics 8000 Series

Flow Controlled Pneumatics

Includes single-flow controller, column head pressure gauge. For flow readout via the screen.

Part No. N6621012

Makeup Gas Pneumatics

Includes 0-60 psig regulator, gauge, and snubber. For carrier gas at the detector.

Part No. N6621016

FID Combustion Gas Pneumatics for a Single Channel

Includes H₂ and air pressure regulators, gauges, and snubbers. For combustion gas for one detector.

Part No. N6621018

0-10 mL/min. Flow Accessory

For use with 0.53 mm Capillary Column Adapter, 8000 Series, Sigma Series.

Part No. N6023031

Sigma Series Carrier and Combustion Gas Pneumatics

Split/Splitless Capillary Injector Pneumatics

Includes 0-60 psig regulator and gauge, septum purge, scrubber, needle valve for split flow control. One module. Application: For use with N6022030 or N6022031 capillary injector. For automatic operation order Timed Event Accessory N6025001.

Part No. N6023060

0-10 mL/min. Flow Accessory

Use with 0.53 mm capillary column adapter.

Part No. N6023031

AutoSystem™ Series Pneumatics

Flow Controller and Gauge with Screen Readout

Includes flow controller, gauge, and transducer for mounting into an empty instrument pneumatic panel.

Part No. N6120004

Pressure Regulator with Screen Readout

Includes pressure regulator (0-60 psig) and transducer for mounting into an empty instrument panel.

Part No. N6120005

Preset Pressure Regulator

Consists of a preset (30 psig) nonadjustable pressure regulator for use with detector gases. Recommended for use on hydrogen and air for FID.

Part No. N6101473

0-20 mL/min. Flow Accessory

For use when converting a flow controller for low flow applications.

Part No. N6101377

PPC Detector Control Pneumatics Add-on Kit

Kit includes parts to add one channel of PPC control for detector gas to an existing detector. For use with hydrogen or air on FID, NPD, and FPD; makeup on ECD and PID; reference gas on TCD; and reaction gas on ELCD. Requires but does not include appropriate PPC frit (see table). **Note:** Do not use for ELCD or TCD makeup. These require special kits with tees. The AutoSystem XL must be PPC ready. If not, PPC upgrade kit (N6120146) is required. Installation by PerkinElmer Service is required but not included.

Part No. N6120148

PPC Flow Control Pneumatics Add-on Kit for Packed or POC Injector

Kit includes parts to add PPC control for carrier gas to an existing packed or POC injector. Requires but does not include appropriate PPC frit (see table). The AutoSystem XL must be PPC ready. If not, PPC upgrade kit (N6120146) is required. Installation by PerkinElmer Service is required but not included.

Part No. N6120149

PPC Upgrade Kit for AutoSystem XL

Kit includes the main control board and hardware to add PPC capability to an existing AutoSystem XL Gas Chromatograph. Installation by PerkinElmer Service is required but not included.

Part No. N6120146

Auxiliary Gas Pneumatics Box

For use with carrier or combustion gas. 0-100 psig gauge. This compact unit comes in either wall or bench mount, with or without toggle valve for quick shutoff. Design allows several units to be installed together. 1/8 in. Swagelok™ fittings for gas inlet/outlet. Mounting screws included. Dimensions: 15 in. D x 2 in. W x 7 in. H.

Part No. N9302145

Part No. N9302146 (with toggle)

PPC Frits

Injector/Detector	Gas	Frit Number	Part No.
Packed	Carrier	4	N6120155 (black)
Split/Splitless or PSS	Carrier	6	N6120157 (blue)
POC	Carrier	3	N6120154 (yellow)
FID	Hydrogen	4	N6120155 (black)
FID	Air	6	N6120157 (blue)
NPD	Hydrogen	1	N6120152 (silver)
NPD	Air	5	N6120156 (green)
FPD	Hydrogen	4	N6120155 (black)
FPD	Air	5	N6120156 (green)
ECD	Argon/Methane or Nitrogen	4	N6120155 (black)
TCD	Helium	4	N6120155 (black)
TCD	Hydrogen	3	N6120154 (yellow)
POC	Carrier Use for Low Flows (i.e., <3 mL/min)	2	N6120153 (red)

Printer/Plotter Supplies

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Felt Tip Pens

Felt Tip Pens for Model R100A, 056, and 023 Recorders

Color	Qty.	Part No.
Black	pkg. 5	00401740
Red	pkg. 5	00401741
Blue	pkg. 5	00401742
Red	pkg. 5	00231255*

*Long nib pen.

Thermal Paper

Thermal Paper for LCI-100 and GP-100 Printer/Plotters

Black

Part No. N6251026 (pkg. 1)

Part No. N6251027 (pkg. 10)

Thermal Paper for Sigma 10/15 Printer/Plotters

Blue

Part No. 03321910 (pkg. 1)

Black

Part No. 03321911 (pkg. 1)

R-100A Chart Recorder Paper

Description	Qty. (Rolls/box)	Part No.
Chart Paper, 0 to 100 divisions	pkg. 2	C0050610
Chart Paper, 0 to 100, 0 to 1.0	pkg. 2	C0050611

Diconix™ Inkjet Cartridge

Part No. N9302147

Pin-feed Continuous Computer Paper

Description	(Sheets/Box)	Part No.
White standard quality, continuous feed paper. 8 1/2 in. x 11 in., 1 part, 15 lb. weight	3200	N5001409

Chart Paper for Earlier Model Recorders (Single Rolls)

Models	Scale	Divisions	Zero	Part No.
23 and 24	25 cm	100-0	right	00231252
056, 159, and 165	25 cm	110-0	right	01591004
056	24 cm	0-100, 100-0	alternates	00567300





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Terms and Conditions of Sales

Terms and Condition

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1. Delivery Dates and Prices.

a) All delivery and shipment dates indicated on the face hereof are approximate and subject to Seller's availability schedule. Seller will make reasonable efforts to meet the delivery date(s) quoted. However, Seller will not be liable for its failure to meet the quoted delivery dates or for any delay in performance hereunder due to unforeseen circumstances or shortages, due to causes beyond its control, or due to its voluntary or mandatory compliance with any governmental act, regulation, or request. If, by reason of such circumstances, Seller's supplies of the equipment or service (hereafter the "Product(s)") covered hereby are limited, Seller shall have the right to allocate the available supply among its customers in such manner as it, in its sole discretion, determines appropriate.

b) All orders are priced on the basis of an estimated shipment date within ninety (90) days of the date of order to the stated destination. Should Buyer request a change in the estimated shipment date or otherwise cause delay in delivery beyond ninety (90) days from the date of order or request that the Products be shipped outside the country of original delivery, the prices established by this quote shall no longer apply, and Seller's list prices in effect on the actual date of shipment shall be used in determining the price to be paid. Except as provided above, if the price is stated by reference to a published price list, then the price shall be the price on the published price list in effect at the time Seller receives Buyer's purchase order, without regard to the requested delivery date. However, if any Product is ordered prior to the effective date of a published price change and the delivery date is rescheduled, the price in effect at the time of the initial delivery date shall apply.

c) If Buyer requests shipment to a country other than the country originally requested, and if Seller elects not to cancel the order subject to Section 12 hereof, Seller's applicable surcharge for the actual country of delivery shall be added to the price.

d) Notwithstanding any provision to the contrary herein, all prices are subject to increase without notice to reflect changes in: (1) Federal or State laws taxing raw material or processed materials; (2) applicable laws or regulations governing working hours or compensation of labor; or (3) freight charges, insurance costs, duty or other factors affecting costs of shipment.

2. Packing and Loss or Damage in Transit.

Products will be packed for shipment in a manner suitable to the method of shipment specified by Buyer, or to the method selected by Seller in the absence of instructions. Unless otherwise indicated on the face

hereof, all sales hereunder are f.o.b. shipping point, and all risk of loss or damage to equipment in transit is upon Buyer. Payment will be made in accordance with Paragraph 5 below.

3. Payment Due For Partial Deliveries.

Seller may, in its sole discretion, deliver any portion of the Products ordered, regardless of utility to Buyer in the absence of the undelivered portion, and all such partial deliveries shall be accepted and paid for in accordance with the terms of Paragraphs 4 and 5 below. Likewise, completion of any installation services shall not be a condition to Buyer's obligation to remit payment. The making of a partial delivery that, to any extent, is not in accordance with the contract of sale shall not affect the Buyer's obligation hereunder to remit payment.

4. Inspection, Acceptance and Return of Products or Trade-Ins.

Buyer shall inspect the Products immediately on their arrival and shall within five (5) days after arrival give written notice to the Seller of any claim for shortage or that the Products do not conform with the terms of the contract of sale. If the Buyer shall fail to give such notice, the Products shall be deemed accepted and to conform with the terms of the contract of sale and the Buyer shall be bound to pay for the Products in accordance with the terms of Paragraph 5 below. Return of Products, defective or otherwise, will not be accepted by Seller without notification from Buyer to Seller within 30 days of receipt of invoice and with subsequent authorization of Seller. Products authorized to be returned shall be shipped f.o.b. destination, freight prepaid. When return of nonconforming goods has been accepted by Seller, conforming shipment may be made in accordance with Paragraph 1 above and Paragraph 8 below without further liability on Seller's part. Buyer will be liable for restocking charges in the event Products are returned to the Seller which are not defective and are in accordance with these terms. When a trade-in is authorized by Seller, Buyer shall ship, f.o.b. destination, freight prepaid, the material or equipment so authorized for trade-in, to Seller's specified location.

5. Payment and Credit Terms.

Unless otherwise indicated on the face hereof, Buyer agrees to remit payment in full to the address provided on the face of Seller's invoice for all shipments, including shipments of any portion of the Products ordered, upon receipt of invoice. This obligation shall not be contingent upon the completion of any installation services included in the purchase price. No cash discounts will be granted. Account balances not paid in accordance with these terms, are subject to the maximum prevailing legal interest rate calculated from date of delinquency. In the event Seller finds it necessary to refer an account to an attorney or an agent

for collection of delinquent accounts, Buyer shall pay all costs of collection including reasonable attorney's fees. Buyer agrees that Seller shall retain a security interest in the Products sold hereunder to secure any portion of the price not paid on delivery and will, on request, execute a security agreement in such form as is required by Seller, which, at Seller's option, may be filed with appropriate local, state, or other relevant authorities. Should Buyer become delinquent in the payment of any sum due hereunder, or if Buyer becomes insolvent, or if any proceedings are commenced under any bankruptcy or similar laws for Buyer's reorganization or other debt adjustment, Seller will not be obligated to continue performance. Seller reserves the right to change the credit terms provided herein when, in Seller's opinion, the financial condition or previous payment record of Buyer so warrants. If, within 30 days, Buyer fails to agree and comply with different terms of credit, and/or fails to give adequate assurance of due performance, Seller may (a) by notice to Buyer, treat such failure or refusal as a repudiation by Buyer of the portion of the purchase order not then fully performed, whereupon Seller may cancel all further deliveries and any amounts unpaid hereunder shall immediately become due and payable; (b) make shipments under reservation of a demand for advance payment or payment against tender of documents of title. Buyer's acceptance of delivery of any Products shall constitute a representation that Buyer is solvent.

6. Taxes.

Buyer is responsible for the ultimate payment of all taxes which may be assessed or levied on or on account of materials sold hereunder to the Buyer whether termed a gross receipts tax, use tax, property tax, sales tax or otherwise. Where Buyer claims that a transaction is not subject to any such tax, that Buyer is exempt, or that Seller is not required to collect such tax, Buyer agrees to provide Seller with any documentation necessary to support such a claim, to allow Seller to document its decision not to collect such tax (es), and to indemnify and hold Seller harmless from and against any and all fines, penalties, interest, taxes, and other expenses, including reasonable attorney's fees, incurred by Seller as a result of reliance upon Buyer's position.

7. Installation and Site Preparation.

Installation services are included in the purchase price of the Products sold hereunder only if expressly so stated on the face of Seller's quotation or in Seller's applicable price list. Installation services for Products transferred outside the country of original delivery by Buyer's actions may be subject to additional charges based on the actual installation site location. For Products requiring installation by Seller's service personnel, it is the responsibility of the Buyer to prepare the site environmentally and provide the required services, power, water, drain, air, bottled gases, permits,

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licenses, approvals, etc., as well as whatever is required to uncrate and move the Product to its location. Failure to do so will result in a service charge by Seller to cover the lost time of its service personnel. Because Seller's service personnel may be required to enter upon Buyer's premises for the purpose of providing service to the Product sold hereunder, Buyer hereby undertakes to maintain its premises in a safe condition and to comply with all applicable laws, statutes and regulations governing workplace health and safety, and hereby accepts full responsibility for any harm, injury, or liability to Seller's personnel while on Buyer's premises, except to the extent caused solely by the negligence of Seller's personnel. Seller's sales and service personnel are not authorized to enter into any indemnity or hold harmless agreements on behalf of Seller. Seller will not, in any event, indemnify, defend or hold Buyer harmless from any liability that it may incur to Seller's sales and service personnel.

8. Limited Warranty.

a) Warranty.

i) Except as otherwise provided herein, Seller warrants to Buyer that the Products sold to Buyer are, at the time of shipment to Buyer from Seller, free from defects in material and workmanship.

ii) This warranty shall be valid for a period of 90 days from the date of shipment to Buyer, unless a different period is specified herein, or in Seller's applicable price list in which case the specified period shall apply. Notwithstanding anything to the contrary contained herein, the warranty period for data processing equipment, including data storage devices, processors, printers, terminals, communication interfaces, tape drives and all similar devices, is in all cases limited to ninety (90) days from the date of shipment to Buyer.

iii) Except in the case of an authorized distributor of Seller, authorized in writing by Seller to extend this warranty to the distributor's customers, the warranty herein applies only to Buyer as the original purchaser from Seller and may not be assigned, sold or otherwise transferred to any third party.

iv) As Buyer's sole and exclusive remedy under this warranty, Seller agrees either to repair or replace, at Seller's sole option, any part or parts of such Products which, under proper and normal conditions of use, prove(s) to be defective within the applicable warranty period. Alternately, Seller may at any time, in its sole discretion, elect to discharge its warranty obligation hereunder by accepting the return of any defective Product pursuant to the terms set forth herein and refunding the purchase price paid by Buyer.

b) Exclusions and Limitations.

i) It is recognized that some parts by their nature may not function for the warranty period applicable to the Product. Therefore, excluded from the warranty herein are chromatography columns, filaments, energy sources, lamps, power amplifier tubes, graphite tubes, sample cell holders, burner and furnace chambers, nebulizers, and other similar parts referenced in the applicable operating manual.

ii) The warranty herein excludes any equipment or accessories which are identified on applicable price lists, quotations, special promotional materials, or on the face hereof, for which this limited warranty may be further limited. Included within this category are items produced by third party manufacturers (as to which Seller passes to Buyer the warranty it has been provided by the manufacturer) and items which are sold at specially reduced prices with reduced warranty protection (in some cases, extended warranty protection may be available at an increased price).

iii) This warranty does not cover loss, damage, or defects resulting from: transportation to the Buyer's facility, improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the Product or improper site preparation or maintenance.

iv) No warranty is made with respect to used, reconstructed, refurbished or previously owned Products, which will be so marked on the face hereof and, unless otherwise indicated on the face hereof, shall be sold "As Is".

v) The warranty herein applies only to Products within the country of original delivery. Products transferred outside the country of original delivery, either by Seller at the direction of Buyer or by Buyer's actions subsequent to delivery, may be subject to additional charges prior to warranty repair or replacement of such Products based on the actual location of such Products and Seller's warranty and/or service surcharges for such location(s).

c) Place of Service.

Except when otherwise provided in Seller's current applicable price list, Seller shall use its best efforts to perform all warranty services hereunder at the Buyer's facility, as soon as reasonably practicable after notification by the Buyer of a possible defect; provided, however, that Seller reserves the right to require that the Buyer return the Product to Seller's production facility, transportation charges prepaid, when necessary to provide proper warranty service.

d) Software and Firmware Products.

The sole and exclusive warranty applicable to software and firmware products provided by Seller for use with a processor will be as follows: Seller warrants that such software and firmware will conform to Seller's program manuals current at the time of shipment to Buyer when properly installed on that processor, provided however that Seller does not warrant that the operation of the processor or software or firmware will be uninterrupted or error-free.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. SELLER EXPRESSLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

9. Exclusive Remedies.

THE REMEDIES PROVIDED HEREIN ARE BUYER'S SOLE AND EXCLUSIVE REMEDIES. SELLER SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR OTHER LEGAL THEORY ARISING OUT OF THE SALE, INSTALLATION, SERVICE OR USE OF ITS PRODUCTS. SELLER NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, SERVICE OR USE OF ITS PRODUCTS.

10. Patent Indemnity.

Seller agrees to defend, at its own expense, any suit or legal proceeding which may be brought against Buyer alleging infringement by Buyer of any patent of the United States, by Buyer's use of the Product sold hereunder for its intended purposes, provided that Buyer shall give Seller prompt written notice of any claim, threat, or institution of suit or legal proceeding, and provided that Seller shall then have the sole right to control and conduct the defense and/or settlement of such claim, threat, suit or legal proceeding, either in the name of Seller or Buyer or both, and Buyer shall, at Seller's request and expense, provide relevant information and reasonable cooperation. Seller shall pay all final judgments and all costs and attorney's fees assessed against Buyer in any such suit or legal proceeding, provided Buyer has complied with the conditions hereof with respect to prompt notice and cooperation in connection with such suit or legal proceeding and given exclusive control thereof to Seller, but Seller shall not be liable for any attorney's fees or other legal expenses incurred by Buyer without the knowledge and prior written consent of Seller. Seller shall also have the right, at its own expense, to procure for Buyer the right to continue using the Product claimed to infringe, replace said Product with an equally satisfactory non-infringing Product, modify said Product so that it becomes non-infringing, or remove such Product and refund the purchase price thereof less a reasonable amount for use, damage or obsolescence.



The foregoing indemnity fully defines Seller's obligation for patent infringement; such obligations to defend and make payment shall specifically not apply to:

- a) an infringement claim resulting from additions or changes in or to the Product made by Buyer or any third party or from use in combination with other equipment; or
- b) an infringement claim which is settled without the consent of Seller; or
- c) an infringement claim which results from compliance by Seller with specifications furnished by Buyer.

The total amount of Seller's obligation and liability under this Section shall not exceed the price paid by Buyer to Seller for the Product held to infringe, and in no event will Seller be held accountable for consequential damages under this indemnity, such as, for example, loss of business profits or goodwill. With respect to goods manufactured in whole or in part to Buyer's specifications, the Buyer will protect and indemnify Seller against all claims for damages or profits arising from infringement of patents, designs, copyrights or trademarks.

11. Modification of Terms.

BUYER'S ACCEPTANCE OF ANY QUOTATION IS EXPRESSLY SUBJECT TO BUYER'S ASSENT TO EACH AND ALL OF THE TERMS AND CONDITIONS SET FORTH IN SELLER'S QUOTATION, AND BUYER'S ASSENT TO THESE TERMS AND CONDITIONS SHALL BE CONCLUSIVELY PRESUMED FROM BUYER'S SUBMISSION OF ITS PURCHASE ORDER. NO ADDITION TO OR MODIFICATION OF SAID TERMS AND CONDITIONS SHALL BE BINDING UPON SELLER UNLESS SPECIFICALLY AGREED TO BY SELLER IN WRITING. IF BUYER'S PURCHASE ORDER OR OTHER CORRESPONDENCE CONTAINS TERMS OR CONDITIONS CONTRARY TO OR IN ADDITION TO THE TERMS AND CONDITIONS CONTAINED IN SELLER'S QUOTATION, ACCEPTANCE OF ANY ORDER BY SELLER SHALL NOT BE CONSTRUED AS ASSENT TO SUCH CONTRARY OR ADDITIONAL TERMS AND CONDITIONS OR CONSTITUTE A WAIVER BY SELLER OF ANY OF THE TERMS AND CONDITIONS CONTAINED IN SELLER'S QUOTATION.

12. Authority to Export.

ALL ORDERS ACCEPTED FOR EXPORT (AND/OR RE-EXPORT) ARE SUBJECT TO: 1) UNITED STATES GOVERNMENT EXPORT REGULATIONS AND; 2) BUYER PROVIDING SELLER WITH ALL DOCUMENTATION NECESSARY FOR SHIPMENT TO THE DESTINATION COUNTRY.

13. Software Licenses and Copyrighted Material.

- a) Seller provides software products by license only. The terms of the license are available from Seller and are accepted by Buyer on delivery of licensed software.

- b) Unless otherwise specified, Seller's copyrighted material (software, firmware, and printed documentation) may not be copied except for archive purposes, to replace a defective copy, or for program error verification by Buyer.

14. Miscellaneous.

- a) Applicable laws. This contract shall be construed in accordance with the laws of the State of New York, U.S.A. without regard to its principles of conflict of laws. Any disputes relating to the contract of sale between Buyer and Seller shall be adjudicated in the state or federal courts in the State of New York, U.S.A., and both parties hereby consent to the jurisdiction of said courts for purposes of any such litigation. The parties expressly agree to waive application of the United Nations Convention on Contracts for the International Sale of Goods.

- b) Confidential Data and Information. If, in connection with the sale, purchase, use, or maintenance of the Products, Seller is requested, required, or deems it advisable to furnish data or information which it, in its sole discretion, deems proprietary, confidential, or both, Seller shall not, in any event, submit or be required to furnish such data or information unless Buyer enters into an agreement concerning the handling, use, copying, retention and return of such information, the form of which agreement is available to Buyer on request. Seller does not agree to accept any proprietary or confidential information of Buyer in the absence of such a written agreement signed by an authorized representative of Seller.

- c) Assignment. Any attempt by Buyer to assign, transfer or delegate any of the rights, duties, warranties, or obligations herein shall be null and void.

- d) Non-waiver. Seller's failure to exercise any of its rights shall not constitute or be deemed a waiver or forfeiture of such rights.

- e) Successors. Any contract for sale incorporating Seller's terms and conditions shall be binding upon the parties thereto, their successors and permitted assigns.

- f) Headings. The headings herein are for convenience only and have no substantive meaning.

- g) Severability. If any provision herein is deemed unenforceable by a court of competent jurisdiction, the other provisions shall remain in full force and effect as if the unenforceable provision had not been included.

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