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Maximize Performance!

Gas Chromatography Accessories and Gas Purification/ Management Products

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Supelco®
Analytical Products

Choosing the proper items for routine system maintenance and new column installation can save costly downtime and rework, plus help prevent inaccurate chromatographic results.

Supelco®, a brand under the Life Science business of Merck KGaA, Darmstadt, Germany, has a legacy of providing high-quality chromatography products and solutions, particularly in gas chromatography. Tracing its roots to 1966, Supelco® Analytical Products has been recognized for its innovative stationary phases, columns, and accessories that have significantly advanced analytical chemistry with a focus on quality, reliability, and supporting you, our customers.

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Choosing the Correct Products

Choosing the proper items for routine system maintenance and new column installation can save costly downtime and rework, plus help prevent inaccurate chromatographic results. For the gas chromatographer, choosing the correct items when upgrading and replacing parts and accessories for their system can bring on many challenges due to the vast array of commercially available products. We offer our own unique Supelco® products, as well as products from some of the most trusted names in the industry, to assist in making the selection process easier.

The Importance of Preventive Maintenance

Preventive maintenance of gas chromatographic systems is often underestimated, yet it is crucial for optimal performance. Typically, maintenance is conducted only after significant issues arise, focusing solely on addressing the immediate problem. A more effective strategy is to adopt a proactive approach to maintenance, aimed at preventing potential problems before they occur. This can be achieved by adhering to a strict schedule of routine preventive maintenance.

Accumulation of non-volatile materials on injection port components can create active sites, resulting in poor chromatography and reduced sensitivity. Regular replacement of injection port items is essential to minimize the adsorption of analytes. Additionally, over time, purifiers become saturated and must be replaced to ensure a continuous supply of chromatographic-grade carrier gas.

To enhance the performance of your chromatographic system, it is vital to utilize high-quality preventive maintenance items. Supelco® offers a comprehensive range of products, including septa, inlet liners, O-rings, inlet seals, ferrules, and purifiers, designed to support the longevity and efficiency of your gas chromatographic system.

Installation and Troubleshooting

In addition to being required for a scheduled preventive maintenance routine, quality products are also needed for installation and troubleshooting tasks. Some of the same items and tools are used whether performing an initial setup of a new instrument, the replacement of system components (such as a column), or troubleshooting activities. To aid in accomplishing these tasks, we offer the highest quality products; products such as column nuts, flow meters, tubing, fittings, valves, gas generators, leak detectors and pressure regulators. Additionally, numerous hand tools have been specifically designed to assist the chromatographer in the installation and maintenance associated with gas chromatography.

Supelco® Products

Throughout this brochure you will find GC Accessories and Gas Purification/Management products that are designed to maximize instrument performance while helping to reduce the risk of chromatographic problems. Please note that this represents a brief listing of the GC Accessories and Gas Purification/Management products that we offer.

Quick Look-Up Tables

These quick look-up tables can be used as a reference to find frequently replaced accessories for commonly used GC instruments. In-depth details (photos, descriptions and specifications) can be found elsewhere in this brochure.

Description	Pkg.	Cat. No.
Agilent 5890, 6890, 7890 GCs		
Molded Thermogreen® LB-2 Septa, 11 mm, with injection hole	50 ea.	**28336-U**
Inlet Liner, Cup Design, Wool Packed, 4 mm I.D.	5 ea.	**2048205**
Inlet Liner, Straight Through, Wool Packed, 4 mm I.D.	5 ea.	**2048605**
Inlet Liner, Single Taper. 4 mm I.D.	5 ea.	**2046605**
Inlet Liner, FocusLiner™, Single Taper, Wool Packed, 4 mm I.D.	5 ea.	**2879905-U**
Inlet Liner O-Ring, 1/4 in.	10 ea.	**21003-U**
Gold Plated Inlet Seal	10 ea.	**23319-U**
Supeltex M-2A Short Capillary Ferrules, 0.25 mm Column	10 ea.	**24803-U**
Supeltex M-4 Short Capillary Ferrules, 0.25 mm Column	10 ea.	**24811-U**
Supeltex M-2A Long Capillary Ferrules, 0.25 mm Column	10 ea.	**24826-U**
Column Nut for Agilent	2 ea.	**24833-U**
Source Column Nut for Agilent MSD	5 ea.	**28034-U**

Description	Pkg.	Cat. No.
PerkinElmer® AutoSystem and Clarus® GCs		
Molded Thermogreen® LB-2 Septa, 11 mm, with injection hole	50 ea.	**28336-U**
Inlet Liner, Straight Through, 2 mm I. D.	5 ea.	**2631105**
Inlet Liner O-Ring, 1/4 in.	10 ea.	**21003-U**
M-2A Long Capillary Ferrules, 0.25 mm Column	10 ea.	**24826-U**
Column Nut for PerkinElmer®	5 ea.	**28034-U**
Varian GCs		
Thermogreen® LB-2 Septa, 9.0 mm	50 ea.	**28021-U**
Molded Thermogreen® LB-2 Septa, 11 mm, with injection hole	50 ea.	**28336-U**
Inlet Liner, SPME, 0.75 mm I.D., for CP-1177 Injector	5 ea.	**2637505**
M-2A Long Capillary Ferrules, 0.25 mm Column	10 ea.	**24826-U**

Septa

Molded Thermogreen® LB-2 Septa

Molded Thermogreen® LB-2 septa are manufactured from high quality, low bleed material using the same exclusive LB-2 rubber formulation that chromatographers are accustomed to using. The difference is that molded septa, unlike traditional die-cut septa, offer easier installation and better sealing. This is because our liquid injection molding process yields septa that all conform to the same shape with crisp, clean sides.

The usable inlet temperature range of 100–350 °C is adequate for the majority of GC applications. Don't be fooled by other septa that advertise a maximum temperature of 400 °C (to make a septa with high thermal limits, one must also make it stiffer, resulting in septa that are harder to pierce and easier to core)! Our molded Thermogreen® LB-2 septa offer the perfect combination of temperature range, low bleed and easy puncturability.

The version with injection hole is for autosampler injections, manual injections and/or SPME applications. The solid disc version is for manual injections.

- Rubber formulation available exclusively as part of the Supelco® portfolio
- Strict tolerances (diameter, thickness and injection hole) due to the constant dimensions of the mold itself
- Ultra low bleed over a wide range of inlet temperatures (100–350 °C)
- No foreign substances or powders (which could contaminate the inlet) are used during manufacturing
- Fully tested for bleed and contamination
- Already conditioned, ready-to-use
- Ideal for use with low bleed GC-MS columns

Description	Pkg.	Cat. No.
11.5 mm, solid discs	250 ea.	29451-U
11 mm, with injection hole	50 ea.	28336-U
11 mm, solid discs	50 ea.	28676-U
	250 ea.	28678-U

Thermogreen® LB-2 Septa

We test every lot of Thermogreen® LB-2 septa, to ensure low bleed and high puncture tolerance. We also condition these septa—they are ready-to-use, right from the container. Popular dimensions are listed below. Other dimensions can be found in our catalog and on our website.

- Exclusive Supelco® formulation
- Extremely low bleed over a wide range of inlet temperatures (100–350 °C)
- Already conditioned, ready-to-use

Description	Pkg.	Cat. No.
9.0 mm	50 ea.	28021-U
9.5 mm	50 ea.	20652
	250 ea.	20666
10 mm	50 ea.	20653-U
	250 ea.	23156
11 mm	50 ea.	20654
	250 ea.	23163
	1000 ea.	23164
11.5 mm	50 ea.	23154
17 mm	50 ea.	23159
Plug (for Shimadzu®)	10 ea.	20608
	50 ea.	20633

Merlin Microseal™ System Kits

The Merlin Microseal™ system incorporates a unique design with two sequential seals that provide long septum life depending on sample composition, operating conditions, and laboratory environment. Usual lifetime ranges from as few as 1,000 to well over 10,000 injections. The patented design is a replacement for the standard septum and septum nut in a capillary inlet system. Popular kits are listed below. Kit components can be found in our catalog and on our website.

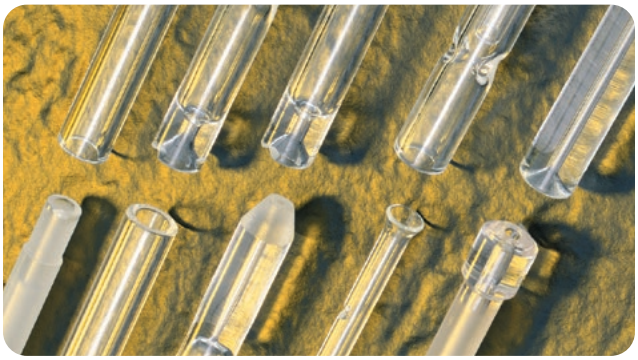
- Sustain many injections without leaks or septum fragments
- For use with 23 gauge blunt tipped needles
- Ideal for use with an SPME device with a 23 gauge needle
- These kits include all necessary items for initial installation

Description	Max Pressure	Cat. No.
For Agilent 5890/6890/7890 GCs	100 psi	24815-U

Liners and Seals

Inlet Liners

A regular schedule of inlet liner replacement as part of a preventive maintenance routine will help prevent adsorption problems that can drastically affect chromatography if left unchecked. Inlet liners should be highly inert and manufactured to the strictest of tolerances. We are recognized as a leader in the manufacturing of high quality inlet liners. Popular inlet liner dimensions are listed below. Other inlet liners can be found in our catalog and on our website.



- Proprietary high temperature silanization (a Supelco® portfolio exclusive) ensures inertness
- Inlet liners that are packed use a high-quality glass wool, deactivated using our exclusive Supelco® proprietary silanization process

Description	Pkg.	Cat. No.
Agilent 5890/6890/7890 (78.5 mm length x 6.3 mm O.D.)		
Split with cup, 4 mm I.D., unpacked	5 ea.	**2051005**
Split with cup, 4 mm I.D., wool packed	5 ea.	**2048205**
Split straight through, 4 mm I.D., wool packed	5 ea.	**2048605**
Splitless with single taper, 4 mm I.D., unpacked	5 ea.	**2046605**
Splitless with single taper, 4 mm I.D., wool packed	5 ea.	**2047805**
Splitless with dual taper, 4 mm I.D., unpacked	5 ea.	**2048505**
Splitless straight through, 2 mm I.D., unpacked	5 ea.	**2051305**
SPME, 0.75 mm I.D., unpacked	5 ea.	**2637505**
Finnigan or Varian CP-1177 Injectors		
Same catalog numbers as Agilent		
PerkinElmer® AutoSystem and Clarus® (92 mm length x 6.3 mm O.D.)		
Split, 4 mm I.D., wool packed	5 ea.	**2631005**
Splitless straight through, 2 mm I.D., unpacked	5 ea.	**2631105**
Shimadzu® 17A with SPL-17 Injector (95 mm length x 5 mm O.D.)		
SPME, 0.75 mm I.D., unpacked	5 ea.	**2633905**

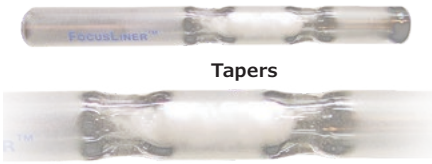
Glass Wool

Glass wool is a fine pliable untreated glass fiber. Silanized glass wool and Pesticide Grade glass wool undergo a proprietary deactivation process to remove active sites that may interfere with an analysis.

- Maximum temperature 400 °C
- Silanized – use where minimal activity is required
- Pesticide Grade – use in the analysis of pesticides
- Phosphoric Acid Treated – use in the analysis of free acids, phenols and glycols
- Puller/Inserter – easily inserts or removes glass wool plugs

Description	Pkg.	Cat. No.
Silanized	50 g	**20411**
Pesticide Grade	10 g	**20409**
Phosphoric Acid Treated	50 g	**20383**
Pesticide grade (silanized)	100 g	**21688-U**
Silianized	250 g	**20410**
Non-treated	50 g	**20384**
Puller/Inserter Tool	2 ea.	**22406**

FocusLiner™ Inlet Liners



Tapers

Wool plugs in inlet liners have been used for many years to promote the rapid vaporization of the entire sample, minimize mass discrimination and prevent non-volatile material from entering the column. FocusLiner inlet liners incorporate a unique design that prevents shifting of the wool plug during repeated injections or sudden inlet pressure changes. Popular FocusLiner™ inlet liners are listed below. Other inlet liners can be found in our catalog and on our website.

- Tapers inside the liner stabilize the position of the wool plug, the wool plug is always correctly located
- Unique design prevents shifting of the wool plug during repeated injections or sudden inlet pressure changes
- Large surface area for maximum sample vaporization
- Wiping action removes residual liquid sample from the needle tip, thus preventing droplet formation
- Reduced solvent tailing
- Lower mass discrimination during split injections
- Typically reduces injection variability by at least 96%
- Provide maximum sensitivity and improved detection levels
- High temperature deactivated glass
- Guaranteed to fit

Description	Pkg.	Cat. No.
Agilent 5890/6890/7890 (78.5 mm length x 6.3 mm O.D.)		
Split/splitless, 4 mm I.D., wool packed	5 ea.	**2879805-U**
Split/splitless with single taper, 4 mm I.D., wool packed	5 ea.	**2879905-U**
Finnigan or Varian CP-1177 Injectors		
Same catalog numbers as Agilent		
PerkinElmer® AutoSystem and Clarus® (92 mm length x 6.3 mm O.D.)		
Split/splitless, 4 mm I.D., wool packed	5 ea.	**2879205-U**
Shimadzu® 17A with SPL-17 Injector (95 mm length x 5 mm O.D.)		
Split/splitless, 3.4 mm I.D., wool packed	5 ea.	**2878605-U**

Inlet Liner O-Ring

Inlet liners used in GC require an O-ring placed near the top for proper operation. This O-ring ensures that the only path for carrier gas to get to the outside of the inlet liner is through the grooves in the inlet seal at the bottom of the injection port.

- Fit 6.3 mm, 6.5 mm, or 1/4” O.D. capillary liners that use an O-ring seal
- Can be used with inlet temperatures up to 375 °C without sticking or fragmenting
- Superior replacements for O-rings made from fluorocarbon (FKM) polymer

Description	Pkg.	Cat. No.
Inlet Liner O-Ring	10 ea.	**21003-U**
Inlet Liner O-Ring	30 pkg.	**21004-U**

Inlet Seals

The inlet seals in an Agilent GC must be regularly changed to prevent sample adsorption due to accumulation of sample residue and/ or septum fragments. We offer replacement inlet seals of the highest quality.

- Stainless steel for analyses of non-reactive compounds
- Pure gold plating for applications requiring more inertness
- No brighteners used in the plating process
- Cross design intended for high split flows (>200 mL/min.)
- Packs of two or ten include one washer for each seal

Description	Pkg.	Cat. No.
Gold-plated	2 ea.	**23318-U**
	10 ea.	**23319-U**
Gold-plated, cross design	10 ea.	**23415-U**

Ferrules and Nuts

Ferrules

GC ferrules should provide a leak-tight seal, accommodate column O.D. variations, seal with minimum torque and not stick to the column or fittings. Additionally, they should be resilient enough to maintain their seal when column temperature and corresponding back pressure increases. Three popular ferrule compositions that meet these requirements are listed below. Ferrules of other compositions and/or with other internal diameters can be found in our catalog and on our website.

Supeltex M-2A Ferrules

- Max. Temp.: 400 °C
- Composition: Vespel® SP-21 (85% polyimide/15% graphite)
- Characteristics: Seal at 1/4-turn past fingertight.
- Benefits: High reusability. Won't stick to metal or glass. Form leaktight seals without sticking to the column. Do not require back ferrules.

Supeltex M-4 Ferrules

- Max. Temp.: 450 °C
- Composition: Flexible graphite
- Characteristics: Seal at 1/4-turn past fingertight.
- Benefits: An improved design that offers a clean, sharp profile with minimal flash. Maximum sealing surface contact. Reduced risk of column contamination at installation.

CapSeal Bullet Ferrules

- Exclusively available from the Supelco® product portfolio
- Max. Temp.: 450 °C
- Composition: Graphite material captured in aluminum base
- Characteristics: Seal at 1/8-turn past fingertight
- Benefits: Reusable. A special end taper reduces graphite extrusion into fitting. Aluminum base keeps the ferrule from adhering to the fitting, making it easy to remove.

Ferrule Designs

Short design ferrules fit:

- The original nuts that ship with Agilent GCs

Long design ferrules fit:

- MSD source nuts for Agilent GCs
- The original nuts that ship with PerkinElmer® GCs
- The original nuts that ship with Varian GCs

General purpose ferrules fit:

- Supelco® Ferrule Nut Adapters for Agilent GCs
- 1/16 inch compression nuts for PerkinElmer® GCs

0.10–0.25 mm Column I.D., 0.4 mm Ferrule I.D.

Column I.D.	Pkg.	Cat. No.
Supeltex M-2A, Short Design	10 ea.	24803-U
	50 ea.	24807-U
Supeltex M-4, Short Design	10 ea	24811-U
CapSeal Bullet, Short Design	10 ea.	23864
	50 ea.	23867
Supeltex M-2A, Long Design	10 ea.	24826-U
	50 ea.	28022-U
Supeltex M-4, Long Design	10 ea.	28025-U
Supeltex M-2A, General Purpose	10 ea.	503258
	50 ea.	22474
Supeltex M-4, General Purpose	10 ea.	22498
	50 ea.	22480-U

Column Nuts

24833-U

22470-U

28034-U

Improper nut/ferrule combinations create dead volume (empty space between the ferrule and the injection port that is not swept by carrier gas). This may result in poor chromatography, as evidenced by fronting peaks and band broadening. Ensure that your chromatography is the best by always using the proper nut/ ferrule combination.

Description	Ferrules Used	Pkg.	Cat. No.
Agilent nut	Short design	2 ea.	24833-U
Supelco® ferrule nut adapter	General purpose	2 ea.	22470-U
Agilent MSD source nut	Long design	5 ea.	28034-U
PerkinElmer® nut	Long design	5 ea.	28034-U

For assistance in determining the correct nut/ ferrule combination, contact Life Science Technical Support Tel: 0800 6271150 or **www.sigmaaldrich.com/techservice**

Guard Columns and Connectors

Fused Silica Guard Columns

For use as guard columns to protect analytical columns from damaging sample components. Match the deactivation of the tubing with the polarity of the injection solvent.

Deactivation	Injection Solvents	Max. Temp.
Non-Polar	Alkanes, Carbon disulfide, Ethers	360 °C
Intermediate Polarity	Acetone, Methylene chloride, Toluene	360 °C
Polar	Acetonitrile, Methanol, Water	260 °C

Length (m)	I.D. (mm)	Cat. No.
Non-Polar Deactivation		
5	0.25	25742
3	0.32	25723
5	0.32	25743
1	0.53	25307
Intermediate Polarity Deactivation		
5	0.25	25747
1	0.32	25708

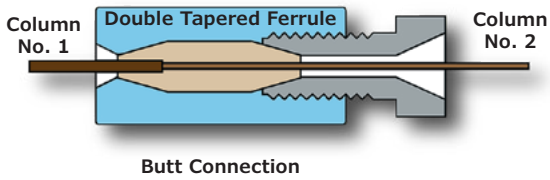
Fused Silica Tubing Inner/ Outer Diameters

Tubing I.D.	Tubing I.D. Range	Tubing O.D. Range
0.10 mm (1)	0.094 – 0.106 mm	0.348 – 0.370 mm
0.10 mm (2)	0.094 – 0.106 mm	0.285 – 0.315 mm
0.20 mm	0.194 – 0.206 mm	0.345 – 0.375 mm
0.25 mm	0.244 – 0.256 mm	0.345 – 0.375 mm
0.32 mm	0.312 – 0.328 mm	0.425 – 0.455 mm
0.53 mm	0.523 – 0.551 mm	0.650 – 0.690 mm
0.75 mm	0.742 – 0.758 mm	0.875 – 0.925 mm

(1) Columns with non-polar or intermediate polarity stationary phases.

(2) Columns with polar stationary phases.

Capillary Column Butt Connector



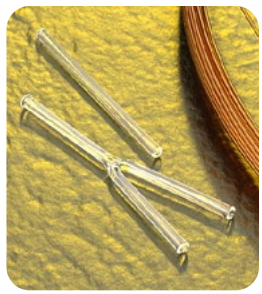
Butt Connection

This device consists of a double-tapered ferrule and a stainless steel compression housing with a threaded cap. Small and light (2.3 cm x 0.6 cm, 4.4 g with ferrule), it provides a gas tight seal with zero dead volume. This unit maintains inertness with no change in column efficiency.

Description	Cat. No.
Capillary Column Butt Connector, body only	23804
Supeltex M-2B Ferrules, pack of 2, Max. Temp. 350 °C	
To connect 0.20/0.25 mm I.D. to 0.20/0.25 mm I.D.	22453
To connect 0.53 mm I.D. to 0.53 mm I.D.	22591
To connect 0.32 mm I.D. to 0.53 mm I.D.	22586

GlasSeal Capillary Column Connectors

Use a GlasSeal connector to attach a guard column to an analytical column or to repair a column which has broken. Use a GlasSeal “Y” connector to split a sample to two columns for confirmatory analysis or to split the output of one column to two detectors. Silanized for an inert inside surface, these can be used with our 0.10–0.53 mm I.D. tubing. To make this an extremely durable connection, use a small drop of polyimide sealing resin (cure at 200 °C, maximum temperature 350 °C).



Description	Pkg.	Cat. No.
Borosilicate Glass Connector	12 ea	20479
Fused Silica Connector	5 ea	23627
Fused Silica Connector	25 ea	23628
Borosilicate Glass “Y” Connector	1 ea	20480
Fused Silica “Y” Connector	3 ea	23632

Flowmeters

Gas chromatographers must routinely measure gas flows (when setting up an instrument, developing a method, or trouble-shooting). Even though many GCs have electronic pressure control (EPC) for setting flow rates, a flowmeter is still an essential tool to verify EPC readings when troubleshooting. Additionally, older GCs do not have EPC, requiring that flows be set manually. There are a variety of flow measuring devices available for this, falling into one of two categories, volumetric (bubble) flowmeters and mass flowmeters.

Ellutia 7000 Digital Volumetric/ Mass Flowmeter

This pocket-sized flowmeter has a large OLED display, which makes reading flows clear and easy. Unlike other flowmeters, the Ellutia 7000 can operate in either a volumetric or a mass mode. The built-in rechargeable battery means the user no longer has to worry about changing dead batteries.

- Mode: volumetric or mass measurements
- Split ratio mode: yes
- Gases: air, argon, argon/methane, carbon dioxide, helium, hydrogen, nitrogen, and oxygen
- Inlet pressure: 25 psi (175 kpa) maximum
- Inlet: 1/16” I.D. flexible tubing (included)
- Flow range: 0.1 to 500 mL/min (0.1 to 275 mL/min for carbon dioxide)
- Resolution: 0.1 mL/min
- Accuracy: ±2.5% of reading or ±0.4 mL/min (whichever is greater), able to dial in column I.D., temperature, and pressure values for added accuracy
- Display: OLED
- Calibration: 25-point, ISO 17025 traceability, recalibration service available
- Declaration of Conformity according to ISO/IEC Guide 22 and EN 45014
- Temperature: 15-35 °C
- Size: 68 x 130 x 30 mm
- Weight: 150 g
- Power: internal battery (automatic shutoff feature conserves battery), charge battery using a 110 VAC charger or a micro-USB cable
- CE mark: yes
- Data output: USB cable

Description	Pkg.	Cat. No.
Ellutia 7000 Digital Volumetric/ Mass Flowmeter	1 ea.	29597-U

Aalborg® Digital Mass Flowmeters

These easy-to-use instruments can be used to measure gas flow rates for common GC gases. The 1/4” NPT fittings on both the inlet and outlet allows installation in-line to provide continuous measurements. These units can also be used as hand-held units by attaching a short length of flexible tubing to the inlet.

- Mode: mass measurements
- Gases: air, argon/methane, carbon dioxide, helium, hydrogen, and nitrogen
- Inlet pressure: 500 psi (34.5 bar) maximum; optimal operation at 20 psi (1.4 bar)
- Inlet/outlet: 1/4” NPT fittings
- Flow range: depends on model (7 models, from as low as 0 to 50 mL/min to as high as 0 to 10 L/min)
- Accuracy: ±1.5% of reading
- Display: digital LCD, tiltable (more than 90°)
- Power: external battery, charge battery using 110 or 230 VAC charger

Aalborg® Digital Mass Flow Meter

Description	Cat. No.
Flow Range, 0-50 mL/min	503894
Flow Range, 0-100 mL/min	503908
Flow Range, 0-200 mL/min	503916
Flow Range, 0-500 mL/min	503924
Flow Range, 0-1 L/min	503932
Flow Range, 0-5 L/min	503940
Flow Range, 0-10 L/min	503959
Aalborg® Mass Flowmeter Power Supply AC input 230 V (12 VDC)	503290

GC Autosampler Syringes

The syringe is the interface between the sample and the chromatograph. Rapid and precise injection requires a tight fit of the syringe in the autosampler. We carry two brands of top-quality autosampler syringes, Hamilton® and SGE®.

- 23s gauge needles – for standard injections
- 26s gauge needles – for on-column and split/splitless injection
- 23s–26s dual gauge needles perform all applications without the need to change syringes
- Available with fixed needle or removable needle

Agilent (7673, 7683 and 6850)

Manufacturer Model Number	Volume	Needle Length in./mm	Gauge	O.D. mm	Point Style	Manufacturer Part No.	Pkg. Size	Cat. No.
Hamilton®								
Modified Microliter Syringes - Removable Needle								
7000.5ASRN	0.5 µL	1.71/43	26s	0.47	Cone	86274	1	**26215**
7001ASRN	1 µL	1.71/43	23s	0.64	Cone	80176	1	**26216**
Microliter Syringes - Fixed Needle								
75ASN	5 µL	1.71/43	23s	0.64	Cone	87987	1	**21311**
75ASN	5 µL 6/pk	1.71/43	23s	0.64	Cone	87990	6	**21315**
75ASN	5 µL 6/pk	1.71/43	23s-26s	0.64-0.47	Cone	87994	6	**24571**
701ASN	10 µL	1.71/43	23s	0.64	Cone	80387	1	**21313**
701ASN	10 µL	1.71/43	26s	0.47	Cone	80388	1	**21312**
701ASN	10 µL	1.71/43	23s-26s	0.64-0.47	Cone	80393	1	**24573**
701ASN	10 µL 6/pk	1.71/43	23s	0.64	Cone	80390	6	**21317**
701ASN	10 µL 6/pk	1.71/43	26s	0.47	Cone	80389	6	**21316**
701ASN	10 µL 6/pk	1.71/43	23s-26s	0.64-0.47	Cone	80391	6	**24574**
701ASN	10 µL	1.71/43	26s	0.47	Bevel	80399	1	**26722**
Microliter Syringes - Removable Needle								
75ASRN	5 µL	1.71/43	23s	0.64	Cone	87957	1	**21321**
701ASRN	10 µL	1.71/43	23s-26s	0.64-0.47	Cone	80359	1	**24575**
Gastight Syringes - Fixed Needle								
1701	10 µL	1.71/43	23s	0.64	Cone	80080	1	**26719**
1701	10 µL	1.71/43	23s-26s	0.64-0.47	Cone	80079	1	**24579**
1701	10 µL 6/pk	1.71/43	23s	0.64	Cone	80094	6	**26701**
1701	10 µL 6/pk	1.71/43	23s-26s	0.64-0.47	Cone	80096	6	**24580**
SGE®								
Fixed Needle								
SK-5F-HP-0.47	5 µL	1.65/42	26	0.47	Cone	001804	6	**21910**
SK-5F-HP-0.63	5 µL	1.65/42	23	0.63	Cone	001814	6	**21911**
SK-10F-HP-0.47	10 µL	1.65/42	26	0.47	Cone	002804	6	**21912**
SK-10F-HP-0.63	10 µL	1.65/42	23	0.63	Cone	002814	6	**21544**
Fixed Needle - Dual Gauge								
5F-HP-0.63/0.47	5 µL	1.65/42	23-26	0.63/0.47	Cone	001822	6	**26887-U**
10F-HP-0.63/0.47	10 µL	1.65/42	23-26	0.63/0.47	Cone	002822	6	**26889-U**
Removable Needle								
0.5BR-HP-0.63	0.5 µL	1.65/42	23	0.63	Cone	000410	1	**24403**
Gas Tight - Fixed Needle, Dual Gauge								
SK-10F-HP-GT-0.63/0.47	10 µL	1.65/42	23-26	0.63/0.47	Cone	002827	6	**26891-U**

CTC (GC PAL Autosamplers)

Manufacturer Model Number	Volume	Needle Length in./mm	Gauge	O.D. mm	Point Style	Manufacturer Part No.	Pkg. Size	Cat. No.
Microliter Syringes - Fixed Needle								
7701.2N	1.2 µL	2/51	26P	---	Cone	203185	1	**28617-U**
75N	5 µL	2/51	26s	0.47	Cone	203189	1	**28613-U**
701N	10 µL	2/51	26s	0.47	Bevel	203072	1	**28614-U**
701N	10 µL	2/51	26s	0.47	Cone	203205	1	**28615-U**
701N	10 µL	2/51	23s	0.64	Cone	203361	1	**29603-U**

PerkinElmer® (GC Autosystem and Clarus® 500)

Manufacturer Model Number	Volume	Needle Length in./mm	Gauge	O.D. mm	Point Style	Manufacturer Part No.	Pkg. Size	Cat. No.
Hamilton®								
Microliter Syringes - Fixed Needle								
75ASN/PE	5 µL	2.75/70	23s	0.64	Blunt	88035	1	**24523**
SGE®								
Fixed Needle								
5F-PE-0.47	5 µL	2.75/70	26	0.47	Cone	001953	1	**509736**
5F-PE-0.63	5 µL	2.75/70	23	0.63	Cone	001954	1	**509744**
Removable Needle (Plunger-in-needle)								
0.5BR-PE-0.63	0.5 µL	2.75/70	23	0.63	Cone	000478	1	**24407**
Gas Tight Syringes - Fixed Needle								
5F-PE-GT-0.63	5 µL	2.75/70	23	0.63	Cone	001957	1	**21929-U**

Shimadzu® (AOC9 Autosampler)

Manufacturer Model Number	Volume	Needle Length in./mm	Gauge	O.D. mm	Point Style	Manufacturer Part No.	Pkg. Size	Cat. No.
Hamilton®								
Microliter Syringe - Removable Needle								
701	10 µL	2/51	26s	0.47	Bevel	80330	1	**20697**

Shimadzu® (AOC9 Autosampler and AOC 14, AOC 17, and AOC 20 GC Autosamplers)

Manufacturer Model Number	Volume	Needle Length in./mm	Gauge	O.D. mm	Point Style	Manufacturer Part No.	Pkg. Size	Cat. No.
SGE®								
Removable Needle								
10R-S-0.47	10 µL	1.65/42	26	0.47	Cone	002897	1	**24418**
10R-S-0.63	10 µL	1.65/42	23	0.63	Cone	002898	1	**24419**
Gas Tight - Removable Needle								
10R-S-GT-0.63	10 µL	1.65/42	23	0.63	Cone	002902	1	**29621-U**

Thermo Finnigan Autosamplers

Manufacturer Model Number	Volume	Needle Length in./mm	Gauge	O.D. mm	Point Style	Manufacturer Part No.	Pkg. Size	Cat. No.
Hamilton®								
Microliter Syringes - Fixed Needle								
701	10 µL	2/51	26s	0.47	Bevel	80300	1	**20734**
701	10 µL	2/51	26s	0.47	Bevel	80366	6	**20779**
701	10 µL	2/51	26s	0.47	Cone tip, Side-port	80339	1	**24532**

Varian Autosamplers

Manufacturer Model Number	Volume	Needle Length in./mm	Gauge	O.D. mm	Point Style	Manufacturer Part No.	Pkg. Size	Cat. No.
SGE®								
Varian 8035, 8100, and 8200 GC Autosamplers - Removable Needle								
10R-VA8X-11	10 µL	2.09/53	25	0.5	Cone tip, Side-port	002924	1	**24421**

Low Adsorption (LA) Vials

Features and Benefits

- Maintains sample integrity during storage
- Minimizes pH shifts in the sample
- Reduces metal contamination in the sample
- Compatible with most autosamplers

Supelco® Certified Low Adsorption (LA) vials are manufactured using a process that decreases the number of hydroxyl groups on the vial's glass surface, significantly reducing surface activity while improving analytical quantization and minimizing pH shifts in the sample. This same process also removes unwanted surface metals such as sodium and boron that can contaminate samples and interfere with trace analysis. Unlike other methods used to decrease vial surface activity, the elimination of surface activity in the LA vials is integral to the manufacturing process and is not a chemical surface treatment.

Supelco® Certified LA vials are manufactured from Type 1 borosilicate glass and are offered in four styles: Center Drain (CD), MRQ30 CD, QSertVial and a standard 12 x 32 mm autosampler vial. These new low adsorption CD, MRQ30 and QSertVial products now offer the benefit of maximum sample extraction without the worry of trace analytes being adsorbed by the vial surface.

Low Adsorption (LA) Vials

Description	Pkg. Size	Cat. No.
2 mL, Clear, PTFE/Silicone Septum with Marking Spot	100	29651-U
2 mL, Clear, PTFE/Silicone Septum with Slit, with Marking Spot	100	29652-U
2 mL, Amber, PTFE/Slicone Septum with Marking Spot	100	29653-U
2 mL, Amber, PTFE/Slicone Septum with Slit, with Marking Spot	100	29654-U

Low Adsorption (LA) CD

Description	Pkg. Size	Cat. No.
1.5 mL, Clear, PTFE/Silicone Septum	100	29655-U
1.5 mL, Clear, PTFE/Silicone Septum with Slit	100	29656-U

Low Adsorption (LA) MRQ30 CD

Description	Pkg. Size	Cat. No.
1.2 mL, MRQ30, PTFE/Silicone Septum	100	29658-U
1.2 mL, MRQ30, PTFE/Silicone Septum with Slit	100	29659-U

Low Adsorption (LA) QsertVial

Description	Pkg. Size	Cat. No.
0.3 mL, Clear Glass, Natural PTFE/Silicone Septum	100	29661-U
0.3 mL, Clear Glass, Natural PTFE/Silicone Septum with Slit	100	29662-U
0. 3mL, Amber Glass, Natural PTFE/Silicone Septum	100	29663-U
0.3 mL, Amber Glass, Natural PTFE/Silicone Septum with Slit	100	29664-U

MSQ Caps with Septa, Mass Spec Quality

Description	Pkg. Size	Cat. No.
Blue 9 mm Cap, PTFE/Silicone Septum	100	29665-U
Blue 9 mm Cap, PTFE/Silicone Septum with Slit	100	29666-U

GC Autosampler Vials

A critical component to a successful chromatography analysis is the autosampler vial. Autosampler vials in several configurations to assist in maintaining sample integrity are available from our Supelco® portfolio.

- Available with crimp seals or screw caps
- Available in clear or amber glass (amber glass protects sensitive samples from exposure to UV light)
- Silanized glass available in some configurations (silanization prevents adsorption on glass surfaces)

Crimp Top Vials

Description	Pack Size	Cat. No.	Pack Size	Cat. No.
12 x 32 mm, 6.0 mm Opening				
Vials				
2.0 mL, Clear glass, 6.0 mm opening, crimp top	100	SU860055	1000	854964
2.0 mL, Amber glass, 6.0 mm opening, crimp top	–	–	1000	854981
2.0 mL, Clear glass, 6.0 mm opening, crimp top, silanized	–	–	1000	27061
2.0 mL, Amber glass, 6.0 mm opening, crimp top, with marking spot	100	854998	–	–
0.1 mL, Limited volume vials, clear glass	100	24714	–	–
Inserts for 6.0mm vials				
0.1 mL Glass insert with bottom spring, 6 x 28 mm	100	SU860066	1000	854110
0.1 mL Glass insert, conical, 6 x 31 mm	100	SU860067	1000	854988
0.25 mL Glass insert, conical, 6 x 31 mm	100	24717	–	–
0.35 mL Glass insert, shell style, 6 x 31 mm	100	24715	1000	24716
11mm Crimp caps				
Aluminum, clear, 5.5 mm opening, TEF/natural rubber, 1.0 mm thick	100	854140	1000	854980-U
Aluminum, clear, 5.5 mm opening, PTFE/white silicone, 1.3 mm thick	100	SU860094	–	–
Convenience kits				
2.0 mL Clear vials, with PTFE/red rubber cap, unassembled	100	27239	–	–

Snap Top Vials

Description	Pack Size	Cat. No.	Pack Size	Cat. No.
12 x 32 mm, 6.0 mm Opening				
Vials				
2.0 mL Clear glass, 6.0 mm opening	–	–	1000	854974
2.0 mL Clear glass, 6.0 mm opening, with marking spot	100	SU860081	–	–
Inserts for 6.0mm vials				
0.1 mL Glass insert with bottom spring, 6 x 28 mm	100	SU860066	1000	854110
0.1 mL Glass insert, conical, 6 x 31 mm	100	SU860067	1000	854988
0.25 mL Glass insert, conical, 6 x 31 mm	100	24717	–	–
0.35 mL Glass insert, shell style, 6 x 31 mm	100	24715	1000	24716
Snap ring caps				
Polyethylene snap caps, 6 mm opening, TEF/natural rubber liner, 1.0 mm thick	100	SU860090	–	–
Polyethylene snap caps, 6 mm opening, PTFE/silicone liner, 1.3 mm thick	100	SU860093	–	–
Polypropylene snap caps with PTFE liner, 0.3 mm thick	100	24754	–	–

Screw Cap Vials

Description	Pack Size	Cat. No.	Pack Size	Cat. No.
12 x 32 mm, 4.6 mm Opening, 8/425 Thread				
Vials				
2.0 mL, Amber glass, 4.6 mm opening	100	SU860083	–	–
2.0 mL, Clear glass, 4.6 mm opening, with marking spot	100	854171	–	–
2.0 mL, Amber glass, 4.6 mm opening, with marking spot	100	854172	–	–
1.1 mL, Clear glass, tapered bottom, Chromacol (requires sleeve 27335)	100	27317	1000	27318
Inserts for 4.6mm vials				
0.1 mL Glass insert with bottom spring, 5 x 29 mm	100	24707	–	–
0.35 mL Glass insert, shell style, 5 x 31 mm	100	24701	1000	24702
Caps with septa				
Polypropylene cap, black, 5.5 mm centre hole, TEF/natural rubber, 1.3 mm thick	100	SU860091	1000	854984
Polypropylene cap, black, 5.5 mm centre hole, red PTFE/white silicone, 1.3 mm thick	100	SU860076	–	–
Polypropylene cap, black, 5.5 mm centre hole, red PTFE/cream silicone, 1.3 mm thick	–	–	1000	854985
Caps without septa				
Polypropylene cap, black, open top	100	27052	–	–
Phenolic cap, solid caps with PTFE liner	100	27091-U	–	–
Phenolic cap, solid cap with aluminum liner	100	27092-U	–	–
Septa				
Septa, red PTFE/silicone/red PTFE, 1.0 mm thick	100	27096-U	–	–
Septa, beige PTFE/silicone, 1.5 mm thick	100	27095-U	–	–
Septa, red PTFE/white silicone, 1.5 mm thick	100	27097-U	1000	23243
Septa, PTFE/silicone with slit, 1.0 mm thick	–	–	1000	24881
Liner, white PTFE, 0.25 mm thick (for use with solid top cap)	100	27133	–	–
12 x 32 mm, 6.0 mm Opening, 9 mm Thread				
Vials				
2.0 mL, Clear glass, 6.0 mm opening, with marking spot	100	854165	–	–
2.0 mL, Amber glass, 6.0 mm opening, with marking spot	100	SU860033	–	–
Inserts for 6.0mm vials				
0.1 mL, Glass insert with bottom spring, 6 x 28 mm	100	SU860066	1000	854110
0.1 mL, Glass insert, conical, 6 x 31 mm	100	SU860067	1000	854988
0.25 mL, Glass insert, conical, 6 x 31 mm	100	24717	–	–
0.35 mL, Glass insert, shell style, 6 x 31 mm	100	24715	1000	24716
Caps				
Blue polypropylene cap, 6.0 mm centre hole with TEF/natural rubber septa, 1.0 mm thick	100	854161	–	–
Blue polypropylene cap, 6.0 mm centre hole with red PTFE/white silicone septa, 1.0 mm thick	100	SU860092	1000	SU860019
Blue polypropylene cap, 6.0 mm centre hole with red PTFE/white silicone/red PTFE septa, 1.0 mm thick	100	SU860079	–	–
12 x 32 mm, 6.0 mm Opening, 10/425 Thread				
Vials				
2.0 mL, Clear glass, 6.0 mm opening	100	27265	–	–
2.0 mL, Clear glass, 6.0 mm opening, with 0.25 mL glass insert	100	27418	–	–
2.0 mL, Amber glass, 6.0 mm opening	100	27267-U	–	–
2.0 mL, Amber glass, 6.0 mm opening, with 0.25 mL glass insert	100	27419	–	–
1.0 mL, Polypropylene, 6.0 mm opening	100	27269	–	–
Inserts for 6.0mm vials				
0.1 mL, Glass insert with bottom spring, 6 x 29 mm	100	24721	–	–
0.25 mL, Glass insert, conical, 6 x 31 mm	100	24717	–	–
0.35 mL, Glass insert, shell style, 6 x 31 mm	100	24715	1000	24716
Caps for 6.0 mm opening vials				
Polypropylene, black, open top with PTFE/silicone septa, 1.5 mm thick	100	27273	–	–
Septa for 6.0 mm opening vials				
Septa, red PTFE/silicone, 1.5 mm thick	100	27277	–	–
Septa, PTFE/silicone with slit, 1.0 mm thick	100	27279	–	–

Preassembled Sampling Vials

Description	Pkg. Size	Cat. No.
Screw Top with Solid Green Melamine Caps, PTFE Liner		
2 mL, clear glass, standard opening 4.6 mm	100	**27134**
4 mL, clear glass, 15 mm O.D. × 45 mm H	100	**27138**
7 mL, clear glass, 17 mm O.D. × 60 mm H	100	**27150-U**
15 mL, clear glass, 21 mm O.D. × 70 mm H	100	**27161**
22 mL, clear glass, 23 mm O.D. × 85 mm H	100	**27172-U**
40 mL, clear glass, 29 mm O.D. × 82 mm H	100	**27181**
2 mL, amber glass, standard opening, 4.6 mm	100	**27000**
4 mL, amber glass, 15 mm O.D. × 45 mm H	100	**27001-U**
7 mL, amber glass, 17 mm O.D. × 60 mm H	100	**27002-U**
15 mL, amber glass, 21 mm O.D. × 70 mm H	100	**27003**
22 mL, amber glass, 23 mm O.D. × 85 mm H	100	**27004**
40 mL, amber glass, 29 mm O.D. × 82 mm H	100	**27182**

PID Lamps

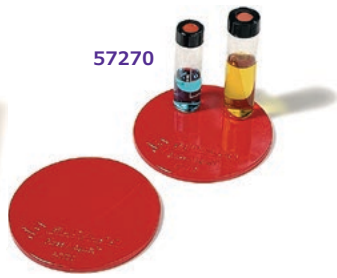
The photoionization detector (PID) lamp is a valuable tool for chromatographers and others investigating the presence of volatile organic compounds (VOCs). In fact, the PID continues to be the preferred choice for detecting VOCs due to its fast response time and sensitivity.

- Can detect volatiles as low as 1 ppb
- Emits very stable, precise photon energy
- More selective alternative than the flame ionization detector (FID)

Description	Chamber Gas	Cat. No.
Model 108, 10.0/10.6 eV	Krypton	**22626**
Model 108-BTEX, 10.0/10.6 eV	Krypton	**23129-U**
PID Window Cleaning Kit	—	**22627**

Vial Accessories

- Hand Crimper – secures vial closure with a consistent and dependable seal
- Decapper – for quick and easy removal of an aluminum seal
- Vial Rack – convenient storage of screw and crimp cap vials
- Glass Magnet – keeps individual vials in place to prevent them from being accidentally knocked over



Description	Pkg.	Cat. No.
Hand Crimper, for use with 11 mm crimp seals	1 ea.	**33195**
Pliers-Type Decapper, for use with 11 mm crimp seals	1 ea.	**33281**
Vial Rack, for 12 x 32 mm vials (holds 50 vials)	5 ea.	**23207**
Glass Magnet, 4 inch diameter	2 ea.	**57270**

Gas Purification (Purifiers)

Effective gas purification starts with identifying the specific contaminants that need to be removed from the gas stream, determining the acceptable reduction levels for these contaminants, and assessing the flow and pressure requirements of the system. Additionally, it is important to establish the desired frequency for purifier replacement. In many cases, multiple purifiers may be required to achieve the necessary contaminant levels, ensuring adequate protection for both the column and detector.

A selection of purifiers suitable for various applications is available below. For a more comprehensive list, please visit our website.

OMI® (Oxygen Moisture Indicating) Polishing Purifier

- Polishing purifier that removes many contaminants that other upstream purifiers miss
- Simultaneously removes moisture, oxygen, carbon monoxide, carbon dioxide, most sulfur compounds, most halogen compounds, alcohols and phenols to less than 10 ppb
- Detects moisture and oxygen in hydrogen, helium, nitrogen, argon and argon/methane
- As little as 1 ppm of moisture or oxygen will change the indicating resin from black to brown
- The indicating resin is licensed exclusively to Supelco® for use in chromatographic applications
- Inert glass body prevents diffusion of ambient room contaminants into the carrier gas stream
- See-through polycarbonate holder provides safety

Supelcarb HC Hydrocarbon Trap

- Removes organics from carrier gases, air and hydrogen
- Twice the trapping ability of activated charcoal

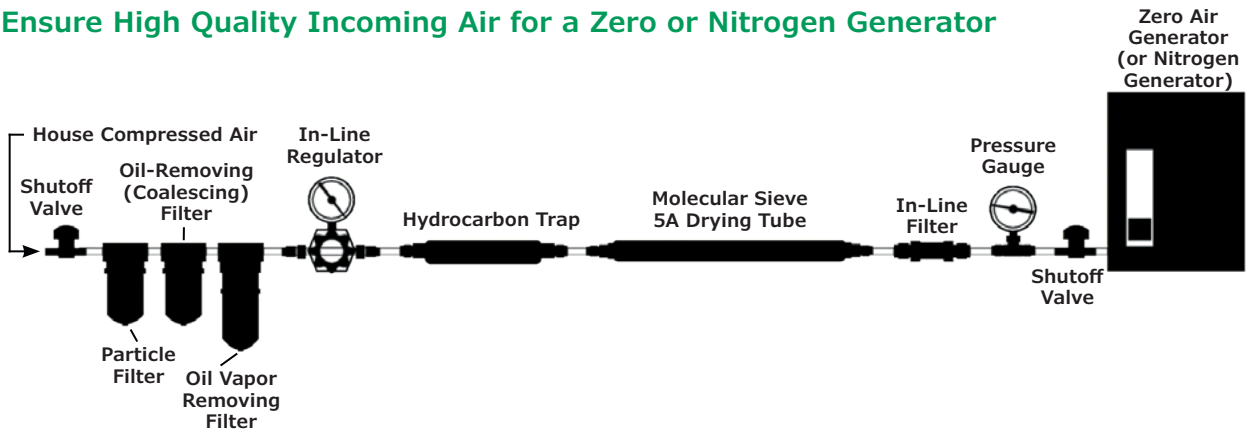
Supelpure HC Hydrocarbon Trap

- Activated charcoal purifier that adsorbs hydrocarbons and other contaminants from carrier gas, compressed air and hydrogen
- When the total hydrocarbons in the incoming gas average 100 ppm, operates efficiently for approximately six months

Molecular Sieve 5Å Water Vapor Trap

- Can reduce moisture in the gas stream to final concentrations less than 0.1 ppm
- Also preferred for use on in-house gas lines where moisture content could be high
- Offers greater working capacity than similar molecular sieves

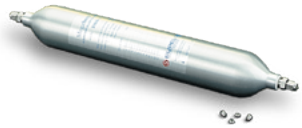
Ensure High Quality Incoming Air for a Zero or Nitrogen Generator



Supelpure-O Oxygen Trap

- Reduces oxygen to less than 0.5 ppm when the level in the incoming gas does not exceed 10 ppm
- Oxygen-removing catalyst coated on a molecular sieve, will also trap significant amounts of moisture
- 120 cc purifier removes up to 1.5 g of moisture
- 750 cc purifier removes up to 10.2 g of moisture

Supelco® Helium Purifier



- Incorporates a highly effective, high capacity adsorbent material to remove hydrocarbons, moisture, oxygen, carbon monoxide and carbon dioxide from helium streams
- Ideal for any GC or GC-MS application where high purity helium is essential
- Output gas is 99.99999% pure
- Output purity:
  <100 ppb total of all contaminants,
  <30 ppb hydrocarbons (as methane),
  <20 ppb moisture,
  <2 ppb oxygen,
  <20 ppb carbon monoxide,
  <20 ppb carbon dioxide

Carbon Dioxin Trap

- Selectively removes carbon dioxide from gas streams
- Contains sodium hydroxide nonfibrous silicate media
- Media changes color from greenish-brown to white as carbon dioxide is absorbed
- Media can absorb 20–30% of its weight in carbon dioxide before reaching saturation
- Media evolves water as carbon dioxide is absorbed (recommend to install a water vapor trap downstream)

Economy Water Vapor Trap

- Economical choice for moisture removal for compressed air service to pneumatically-controlled devices
- Contains a mixture of Molecular Sieves 4Å and 13X
- Purifier body is clear polycarbonate
- Not for use with carrier gases due to permeability of purifier body

Recommended Purifier Options per Application

Carrier gas: need to remove hydrocarbons, moisture and oxygen

Option 1: Supelpure HC, Molecular Sieve 5A, Supelpure-O, OMI®-2

2: Supelco® Helium Purifier, OMI®-2

3: Super Clean Hydrocarbon, Super Clean moisture, Super Clean Oxygen, OMI®-2

4: Super Clean Dual, Super Clean Oxygen, OMI®-2

5: Super Clean Triple, OMI®-2

Compressed air (for FIDs): need to remove hydrocarbons and moisture

Option 1: Supelpure HC, Molecular Sieve 5A

2: Super Clean Hydrocarbon, Super Clean moisture

3: Super Clean dual

Hydrogen fuel gas (for FIDs): need to remove hydrocarbons

Option 1: Supelpure HC

2: Super Clean Hydrocarbon

Compress air (for pneumatic control): need to remove moisture

Option 1: Economy Water Vapor Trap

Purifiers

Description	Design	Indicating?	Fittings	Cat. No.
Polishing Purifiers (remove many contaminants that upstream purifiers miss)				
OMI®-2 purifier tube	In-line (1)	Yes (2)	n/a	**23906**
OMI®-4 purifier tube	In-line (1)	Yes (2)	n/a	**23909**
Hydrocarbon-only Removing Purifiers				
Supelpure HC hydrocarbon trap, 120 cc	In-line	No	1/8 inch	**22445-U**
Supelpure HC hydrocarbon trap, 120 cc	In-line	No	1/4 inch	**22446**
Supelpure HC hydrocarbon trap, 750 cc	In-line	No	1/4 inch	**24518**
Supelpure HC hydrocarbon trap, 750 cc	In-line	No	1/2 inch	**24519**
Moisture-only Removing Purifiers				
Molecular Sieve 5A water vapor trap, 200 cc	In-line	No	1/8 inch	**20619**
Molecular Sieve 5A water vapor trap, 200 cc	In-line	No	1/4 inch	**20618**
Molecular Sieve 5A water vapor trap, 750 cc	In-line	No	1/4 inch	**23991**
Molecular Sieve 5A water vapor trap, 750 cc	In-line	No	1/2 inch	**23992**
Economy water vapor trap, 400 cc	In-line	Yes	1/8 inch	**23987**
Economy water vapor trap, 400 cc	In-line	Yes	1/4 inch	**23988**
Oxygen-only Removing Purifiers				
Supelpure-O oxygen trap, 120 cc	In-line	No	1/8 inch	**22449**
Supelpure-O oxygen trap, 120 cc	In-line	No	1/4 inch	**22450-U**
Supelpure-O oxygen trap, 750 cc	In-line	No	1/4 inch	**503088**
Supelpure-O oxygen trap, 750 cc	In-line	No	1/2 inch	**503096**
Triple Purifiers (remove hydrocarbons, moisture, and oxygen)				
Supelco® Helium purifier	In-line	No	1/8 inch	**27600-U**
Supelco® Helium purifier	In-line	No	1/4 inch	**27601-U**
Super Clean triple purifier	Base-plate (3)	Yes (4)	n/a	**SU861026**
Super Clean triple purifier, helium specific	Base-plate (3)	Yes (4)	n/a	**SU861027**
Carbon Dioxide-only Removing Purifiers				
Carbon dioxide trap, 100 cc	In-line	Yes	1/8 inch	**503185**
Carbon dioxide trap, 100 cc	In-line	Yes	1/4 inch	**503193**
Carbon dioxide trap, 250 cc	In-line	Yes	1/8 inch	**503207**
Carbon dioxide trap, 250 cc	In-line	Yes	1/4 inch	**503215**

1. Must be installed into a reusable holder prior to use.

2. Indicating for moisture and oxygen.

3. Must be installed into a reusable base-plate prior to use.

4. Not indicating for hydrocarbons.

Purifier Accessories

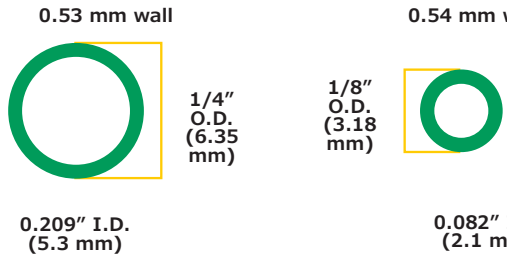
Description	Cat. No.
OMI Holders	
OMI®-2 holder, 1/8 inch stainless steel fittings	**23921**
OMI®-4 holder, 1/8 inch stainless steel fittings	**23926**
Purifier Refills	
Supelpure HC Hydrocarbon Trap Refill volume 474 cc	**22823-U**
Molecular Sieve 5Å water vapor trap refill, non-indicating, 220 g	**20298**
Carbon dioxide trap refill, indicating, 500 cc	**503223**
Economy water vapor trap refill, indicating, 475 cc	**23989**

Tubing, Cutters and Fittings

Many types of tubing are available to supply a variety of gases for gas chromatography systems. We recommend using stainless steel for the most sensitive applications, such as high resolution MS detection (MS-MS, ion trap, or TOF). More economical copper tubing is recommended for all other GC and GC-MS plumbing needs. All of our tubing is specially cleaned to remove any residue. Other tubing choices are available and can be found in our catalog and on **SigmaAldrich.com**.

Premium Grade 304 Stainless Steel Tubing

Stainless Steel Tubing Dimensions



- Virtually impermeable to the diffusion of room air through the tubing walls
- Undergoes a proprietary cleaning procedure to remove all active sites and to ensure inertness
- Best choice for the most sensitive applications, such as high resolution MS detection (MS-MS, ion trap, or TOF)

Cleaned Copper Tubing

- Most commonly used tubing for gas chromatography
- Cleaned according to ASTM B-280 plus a proprietary Supelco® cleaning procedure, resulting in tubing that exceeds instrument manufacturers' requirements
- Best choice for most GC and GC-MS plumbing needs

Description	Cat. No.
Premium Grade 304 Stainless Steel Tubing	
50 ft. x 1/4 inch (6.35 mm) O.D. x 0.209 inch (5.3 mm) I.D.	20527
50 ft. x 1/8 inch (3.18 mm) O.D. x 0.085 inch (2.1 mm) I.D.	20526-U
100 ft. x 1/16 inch (1.59 mm) O.D. x 0.030 inch (0.762 mm) I.D.	20553
Cleaned Copper Tubing	
50 ft. x 1/4 inch (6.35 mm) O.D. x 0.190 inch (4.83 mm) I.D.	20489
50 ft. x 1/8 inch (3.18 mm) O.D. x 0.065 inch (1.65 mm) I.D.	20488

Tubing Cutters

Proper gas line connections are important for maximum chromatographic performance. Leaks, caused by a poor fit between tubing and the mating seat, can cause serious damage to GC columns. Therefore, it is critical for tubing to have crisp, clean ends.

- TC-20 cuts 1/16, 1/8 or 1/4 inch copper or stainless steel
- Heavy duty cuts 1/8 or 1/4 inch copper or stainless steel
- Tubing reamer – opens and rounds tubing after cutting

Description	Cat. No.
Heavy Duty Tubing Cutter	20425-U
Tubing Reamer	20389

Swagelok® Tubing Fittings

A leak free system is the first requirement in a systematic approach to supplying quality gas to a chromatography system. Swagelok® fittings combine superior design principles with close manufacturing tolerance and rigid quality to provide such a leak free connection. Some of the most popular items are listed. For a complete listing, refer to our catalog and/or our website.

Description	Cat. No.
Swagelok® Fittings Kit	22668-U
Nuts plus front and back ferrules, brass, 1/8 inch, 10 ea.	22014
Nuts plus front and back ferrules, stainless steel, 1/8 inch, 5 ea.	22040-U
Tee, brass, 1/8 inch	22020-U
Tee, stainless steel, 1/8 inch	22046
On/off throttling valve, brass, 1/8 inch	22138-U
On/off throttling valve, stainless steel, 1/8 inch	22139-U
Toggle valve, brass, 1/8 inch	22699
Toggle valve, stainless steel, 1/8 inch	22698

Leak Detectors

Using liquids to detect gas leaks in a gas chromatography system can lead to unforeseen problems. Small amounts of liquid can seep into fittings, or through the septum, and damage the column. Electronic leak detectors are a much better alternative than liquid detectors, and can easily and quickly pinpoint gas leaks that are too small to detect with a soap solution. Liquid leak detectors are still available, and can be found in our catalog and on our website.

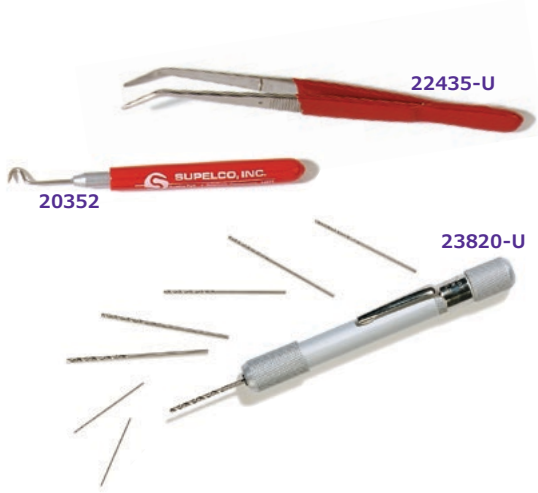
GOW-MAC® Gas Leak Detectors

- Easy to operate
- Allow leaks to be found quickly without risk of contaminating the system
- Provides maximum usable sensitivity with high signal to noise ratio amplification
- Operates on the same principle as a thermal conductivity detector
- Will respond to any gas mixture that has a thermal conductivity value different from that of air
- Include internal, rechargeable batteries and charger

Description	Cat. No.
Model 21-070, miniature, 115 V	22807

Hand Tools

We offer a variety of hand tools that are specifically designed to assist the chromatographer in the installation and maintenance associated with gas chromatography.



Description	Cat. No.
Hook Septum Puller	20352
Stainless Steel Forceps	22435-U
Pin Vise Drill Kit	23820-U

Pressure Regulators

For all chromatographic applications, it is recommended to use a regulator that does not allow contaminants to enter the gas stream. Our HP, HP+ and UHP regulators meet this stringent demand. We only offer regulators with bar stock bodies. Compared to forged body regulators, ours have:

- Smoother internal surfaces resulting in more efficient gas flows (no eddy swirling), and that contaminants will not cling to
- Much smaller internal volumes (about 20X less) that take less time to purge
- Each of our cylinder regulators also has two additional features, which help keep contaminants from entering the regulator body
- A check valve in the inlet fitting, activated during cylinder change-out
- A shut-off valve on the outlet side that can be closed when replacing downstream components

Two-Stage Cylinder Regulators

- Reduces cylinder pressure to a factory-set intermediate pressure, then to a user-set final pressure
- Use when the gas cylinder is located within 25 feet of the instrumentation

Single-Stage Cylinder Regulators

- Reduces cylinder pressure to a user-set intermediate pressure
- Use when the gas cylinder is located more than 25 feet from the instrumentation
- Requires an in-line regulator to be installed within 25 feet of the instrumentation

In-line Regulators

- Reduces an intermediate pressure to a user-set final pressure
- Install within 25 feet of the instrumentation

Cylinder Pressure Regulator Features

Feature	HP	HP+	UHP
Check valve in inlet	•	•	•
Bar stock nickel-plated brass body	•	•	•
Stainless steel diaphragm with captive Teflon seal	•	•	
Stainless steel diaphragm with metal-to-metal seal			•
Nickel-plated zinc bonnets	•	•	
Machined brass bonnets (panel-mount capable)			•
2 ½ inch diameter gauges	•	•	•
Needle shut-off valve	•		
Diaphragm shut-off valve		•	•
1/8 inch male stainless steel Swagelok outlet fitting	•	•	•

Pressure Regulators

Description	Grade	Maximum Inlet Pressure (psi / bar)	Maximum Delivery Pressure (psi / bar)	Cat. No.
CGA 580 Cylinders (for helium, nitrogen, and argon)				
Two-stage	HP	3000 / 204	0-100 / 0-6.9	**29557-U**
Single-stage	HP	3000 / 204	0-100 / 0-6.9	**29556-U**
Two-stage	HP+	3000 / 204	0-150 / 0-10.3	**29575-U**
Two-stage	UHP	3000 / 204	0-100 / 0-6.9	**29585-U**
CGA 350 Cylinders (for hydrogen, methane, and argon/methane)				
Two-stage	UHP	3000 / 204	0-100 / 0-6.9	**29591-U**
CGA 590 Cylinders (for compressed air)				
Two-stage	HP	3000 / 204	0-100 / 0-6.9	**29569-U**
In-line				
Single-stage	UHP	400 / 27	0-100 / 0-6.9	**23884**

Related Information

Interested in learning more? Here is a short list of technical and application pieces designed to assist you in meeting your analyses needs, available for download at no charge. Simply visit **SigmaAldrich.com/gc**, or contact Supelco® Technical Service at **SigmaAldrich.com/customer-support**

Gas Generators

Laboratory gas generators are a great alternative to gas cylinders. In addition to being a much more sensible source of gas from a cost standpoint, generators are safer, cosmetically better, take up less space and do not require the labor needed to transport bulky cylinders into the lab.

Parker® PEM and ChromGas™ Hydrogen Generators

- Easy to use, an electrical outlet and deionized water are all that are required to generate hydrogen for weeks of continuous operation
- Minimal maintenance required
- Uses a solid polymer electrolyte, rather than a liquid electrolyte, eliminating the need for toxic liquids
- Built-in sensing circuit shuts the generator down if a leak is detected
- Can be used with any instrumentation requiring fuel grade hydrogen
- Connections: 1/8” compression fitting
- Delivery purity: 99.9995% (99.99997% for Model 9800)

Parker® ChromGas™ Zero Air Generators

- Easy to use, an electrical outlet and a compressed air source are all that are required to produce ultra-high purity zero air
- Minimal maintenance required
- Recommended for use with flame ionization detectors to stabilize baselines and improve detection
- Inlet air pressure: 2–125 psi
- Connections: 1/8” compression fitting
- Delivery purity: <0.1 ppm total hydrocarbons (as methane)

Description	Max. Output	Cat. No.
Parker® PEM and ChromGas™ Hydrogen Generators		
H2PEM-100, 110–230 V	100 mL/min.; 90 psi	**27773-U**
H2PEM-165, 110–230 V	165 mL/min.; 90 psi	**27620-U**
H2PEM-260, 110–230 V	260 mL/min.; 90 psi	**22751**
H2PEM-510, 110–230 V	510 mL/min.; 90 psi	**22801**
Parker® ChromGas™ Zero Air Generators		
Model 1000, 110 V	1000 mL/min.; 125 psi	**22824**
Model 1001, 230 V	1000 mL/min.; 125 psi	**22830-U**

High-Purity GC Solvents

The comprehensive Supelco® portfolio includes our range of high-purity GC solvents which have been developed with your application in mind to ensure the best signal-to-noise ratio for accurate GC analysis.

SupraSolv® solvents for ECD and FID

Our SupraSolv® ECD and FID range of solvents includes high purity products designed specifically for gas chromatography coupled with a Flame Ionization Detector (FID) or an Electron Capture Detector (EID). Their detector specific characteristics result in stable baselines, broader retention time range and improved signal-to-noise ratio to achieve consistently accurate, reliable, and reproducible results. Typical applications include the determination of polychlorinated biphenyls (PCB) in environmental and food samples.

SupraSolv® solvents for gas chromatography ECD and FID

	Product	Purity (GC) min. [%]	Evap. residue max. [mg/L]	Water max. [%]	Color max. [Hazen]	Content / Packaging	Cat. No.
A	Acetone	99.8	3.0	0.05	10	1 l GL	1.00012.1000
						2.5 l GL	1.00012.2500
						4 l GL	1.00012.4000
						30 l ST	1.00012.9030
	Acetonitrile	99.8	3.0	0.05	10	1 l GL	1.00017.1000
						2.5 l GL	1.00017.2500
						4 l GL	1.00017.4000
B	tert-Butyl methyl ether	99.8	3.0	0.02	10	1 l GL	1.01995.1000
						2.5 l GL	1.01995.2500
C	Chloroform, stabilized	99.8	5.0	0.01	10	1 l GL	1.02432.1000
						2.5 l GL	1.02432.2500
	Cyclohexane	99.8	3.0	0.01	10	1 l GL	1.02817.1000
						2.5 l GL	1.02817.2500
						4 l GL	1.02817.4000
D	Dichloromethane, stabilized	99.8	5.0	0.01	10	1 l GL	1.06054.1000
						2.5 l GL	1.06054.2500
						4 l GL	1.06054.4000
	Diethyl ether, stabilized	98.0	3.0	0.05	10	1 l GL	1.00931.1000
						2.5 l GL	1.00931.2500
	N,N-Dimethylformamide	99.8	3.0	0.05	10	1 l GL	1.10983.1000
						2.5 l GL	1.10983.2500
E	Ethanol	99.8	3.0	0.01	10	1 l GL	1.02371.1000
						2.5 l GL	1.02371.2500
	Ethyl acetate	99.8	3.0	0.02	10	1 l GL	1.10972.1000
						2.5 l GL	1.10972.2500
						4 l GL	1.10972.4000
H	n-Hexane	98.0 *	3.0	0.01	10	1 l GL	1.04371.1000
						2.5 l GL	1.04371.2500
						4 l GL	1.04371.4000
I	Isooctane	99.8	3.0	0.01	10	1 l GL	1.15440.1000
						2.5 l GL	1.15440.2500
M	Methanol	99.8	3.0	0.1	10	1 l GL	1.06011.1000
						2.5 l GL	1.06011.2500
						4 l GL	1.06011.4000
P	n-Pentane	99.8	3.0	0.02	10	1 l GL	1.00882.1000
						2.5 l GL	1.00882.2500
	Petroleum benzine (40–60 °C)	-	3.0	0.01	10	1 l GL	1.01772.1000
						10 l ST	1.01772.9010
	2-Propanol	99.8	3.0	0.1	10	1 l GL	1.00998.1000
						2.5 l GL	1.00998.2500
T	Toluene	99.8	3.0	0.03	10	1 l GL	1.08389.1000
						2.5 l GL	1.08389.2500
						4 l GL	1.08389.4000

GL = glass bottle I ST = stainless steel barrel I * = sum of hexane isomers + methyl cyclopentane (GC) 99.8 0/o I GC-ECD (retention range 1,2,4-Trichlorobenzene to Decachlorobiphenyle individual signals (Lindane standard)) ≤ 3 pg/ml I GC-F D (retention range n-Undecane to n-Tetracontane individual signals (n-Tetradecane standard)) ≤ 3 ng/mlSupraSolv® solvents for gas chromatography MS

SupraSolv® solvents for GC-MS

SupraSolv® MS solvents are specialized for Gas Chromatography with mass spectrometric detection. Their suitability and high purity offer analytical reliability in highly sensitive detection processes like analysis of dioxins (PCDD), furans (PCDF) or polycyclic aromatic hydrocarbons (PAH) in food and environmental samples. They offer minimal interference signals in the relevant retention time window with the best possible batch consistency. As a result, the work becomes more reliable, accurate, and economical.

SupraSolv® solvents for gas chromatography MS

	Product	Purity (GC) min. [%]	Evap. residue max. [mg/L]	Water max. [%]	Color max. [Hazen]	Content / Packaging	Cat. No.
A	Acetone	99.8	3.0	0.05	10	1 l GL	1.00658.1000
						2.5 l GL	1.00658.2500
	Acetonitrile	99.8	3.0	0.05	10	1 l GL	1.00665.1000
						2.5 l GL	1.00665.2500
C	Cyclohexane	99.8	3.0	0.01	10	1 l GL	1.00667.1000
						2.5 l GL	1.00667.2500
D	Dichloromethane, stabilized	99.8	5.0	0.01	10	1 l GL	1.00668.1000
						2.5 l GL	1.00668.2500
E	Ethyl acetate	99.8	3.0	0.02	10	1 l GL	1.00789.1000
						2.5 l GL	1.00789.2500
H	n-Hexane	98.0 *	3.0	0.01	10	1 l GL	1.00795.1000
						2.5 l GL	1.00795.2500
M	Methanol	99.8	3.0	0.1	10	1 l GL	1.00837.1000
						2.5 l GL	1.00837.2500
T	Toluene	99.8	3.0	0.03	10	1 l GL	1.00849.1000
						2.5 l GL	1.00849.2500
W	Water		5.0		10	2.5 l GL	1.03702.2500

GL = glass bottle I * = sum of hexane isomers + methyl cyclopentane (GC) 99.8% I GC-MS (retention range n-Undecane to n-Tetracontane; scanning area 30 - 600 amu individual signals (n-Tetradecane standard)) ≤ 3 ng/ml

SupraSolv® Headspace GC solvents

SupraSolv® Headspace GC solvents are specifically devised for the analysis of residual solvents in drug substances and products following European and United States Pharmacopoeia. These solvents offer accurate analysis as they specify the concentrations of all the residual solvents of the three defined classes in the ICH guideline.

SupraSolv® headspace For the analysis of residual solvents according to ICH, Ph Eur and USP

	Product	Purity (GC) min. [%]	Evap. residue max. [mg/L]	Water max. [%]	Color max. [Hazen]	Content / Packaging	Cat. No.
B	Benzyl alcohol	≥ 99.5 %		0.1 %	≤ 10 Hazen	1 l GL	1.02695.1000
						2.5 l GL	1.02695.2500
D	N,N-Dimethylacetamide	99.8	3.0	0.05	10	1 l GL	1.00399.1000
	N,N-Dimethylformamide	99.8	3.0	0.05	10	1 l GL	1.00202.1000
						2.5 l GL	1.00202.2500
	Dimethyl sulfoxide	99.8	3.0	0.05	10	1 l GL	1.01900.1000
						2.5 l GL	1.01900.2500
W	Water	-	5.0	-	-	1 l GL	1.00577.1000
						2.5 l GL	1.00577.2500
			5.0		10	1 l GL	1.02699.1000
						2.5 l GL	1.02699.2500

GL = glass bottle I Every residual solvent of class 1 acc. CH ≤ 1 µg/g I Every residual solvent of class 2 acc. CH ≤ 10 µg/g I Every residual solvent of class 3 acc. CH ≤ 50 µg/g

Hypergrade solvents for organic trace analysis

Hypergrade solvents offer unique solutions for all the applications regardless of the method (GC-FID, GC-ECD & GC-MS) and the sample used. These solvents have larger retention time and lower permissible concentration of interference signals within the retention time range. Their specifications are broader and higher than that of SupraSolv® solvents and can be used in areas that demand the highest level of reliability in analytical results.

Hypergrade solvents for organic trace analysis

	Product	Purity (GC) min. [%]	Evap. residue max. [mg/L]	Water max. [%]	Color max. [Hazen]	Content / Packaging	Cat. No.
P	Petroleum benzine (40–60 °C)	-	3.0	0.005	10	2.5 l GL	1.16740.2500

GL = glass bottle I * Sum of hexane isomers + methylcyclopentane (GC) :2 99.9% I GC-ECD (retention range Dichloromethane to 1,2,4-Trichlorobenzene individual signals (Tetrachloromethane standard)) :, 1 ng/ml I GC-ECD (retention range 1,2,4-Trichlorobenzene to Decachlorobiphenyl individual signals (Lindane standard)) ≤ 2 pg/ml I GC-F D (retention range n-Undecane to n-Tetracontane individual signals (n-Tetradecane standard)) ≤ 2 ng/ml I GC-MS (retention range n-Undecane to n-Tetracontane; scanning area 30 - 600 amu individual signals (n-Tetradecane)

GC Workflow Solutions to Streamline Your GC Analyses

Whether you use ECD, FID, TCD, MS or another detector—our range of GC columns, solvents, standards & accessories offers a dedicated quality for your specific application and detection method.

Ensure accurate and reliable results while supporting laboratory regulatory requirements with our comprehensive portfolio of solutions for the entire GC workflow

Our complete GC workflow solutions provide:

- Sample collection and preparation products: SPE, purge & traps, water, air sampling etc.
- GC products for analysis: columns, solvents and accessories
- Detection and calibration: certified reference materials and standards, matrix materials etc.

Visit **SigmaAldrich.com/gc** to discover how we can help you to streamline your analyses, whatever your sample matrix

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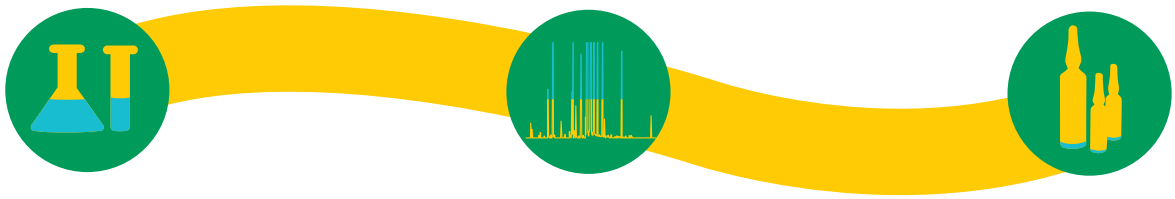
GC ANALYSIS

DETECTION AND CALIBRATION



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Analytical Products

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64293 Darmstadt, Germany

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