



**Thermo Scientific**  
Chromatography Columns  
and Consumables 2016-2017

# Connected chromatography solutions

# GC Columns and Accessories

Thermo Scientific GC columns and accessories are designed to give optimum system performance for today's challenging analyses. Thermo Scientific™ TraceGOLD™, Thermo Scientific™ TRACE™ and Thermo Scientific™ TracePLOT™ columns provide excellent quality and performance. Our range of GC accessories include all the tools needed by today's gas chromatographers.

## Featured Products



### LinerGOLD GC Liners

The GOLD standard in GC liner performance, providing enhanced inertness, leading to increased accuracy and precision in analysis.

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### TraceGOLD GC Columns

The premium standard in GC column performance, delivering low bleed, excellent reproducibility and high levels of inertness.

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### GC Derivatization Reagents

Making the undetectable detectable. Thermo Scientific GC Derivatization reagents provide high levels of purity and reproducibility in analysis.

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### Reacti-Therm Sample Derivatization System

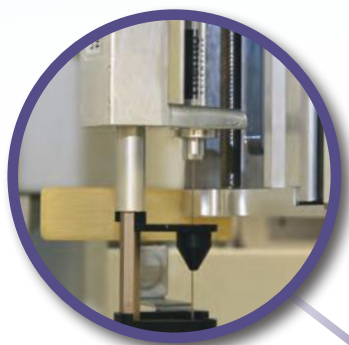
Heating, stirring and evaporation in a single system, offering a complete solution for derivatization and other small-scale reactions.

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# GC Columns and Accessories

## Product Selection Guide

Selection of the correct GC columns and accessories is critical to ensure optimum system performance. The selection guide below is designed to simplify this process



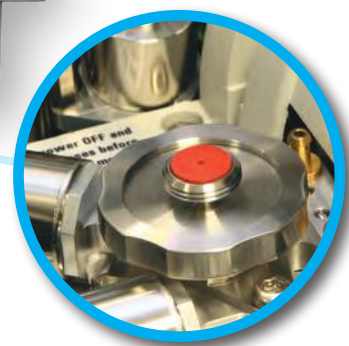
**GC Syringes**



**Vials and Closures**



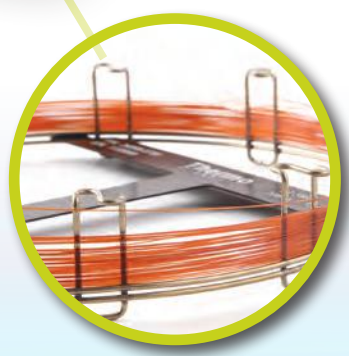
**GC Liners**



**GC Septa**



**GC Ferrules**



**GC Columns**






## Vials and Closures

Nature of Sample	Vial Type Recommended
Routine samples	Clear glass (with or without patch) as SureStop 9mm screw thread or 11mm crimp vial
Light sensitive samples	Amber glass (with or without patch) as SureStop 9mm screw thread or 11mm crimp vial
Low volume samples	Micro-Inserts or Microsampling and High Recovery vials with fixed inserts or reduced internal volume
Trace levels	Silanized glass and/or Certified Kits
Ultra Trace MS analysis	MSCERT kits: The first low particle, low background chromatography vials, pre-cleaned to provide unmatched consistency; tested and certified for up to 15 critical physical characteristics affecting vial performance for mass spectrometry

## GC Septa

Material	Max Operating Temperature	Key Features
BTO	400 °C (330 °C for 17 mm size)	Low bleed
TR-Green	350 °C	Long lifetime
Marathon	350 °C	High mechanical durability
TR-Blue	200–250 °C	Easy to penetrate for routine applications

## GC Liners






Injection Method	Injection Requirements	Liner Requirements
<b>Split</b> 	Enables rapid vaporization and effective mixing of sample	<ul style="list-style-type: none"> <li>Typically open-ended</li> <li>Large surface area &amp; volume</li> <li>Design to aid mixing</li> <li>Low activity</li> </ul>
<b>Splitless</b> 	Sample focused onto column – minimizes sample contact with reactive metal components	<ul style="list-style-type: none"> <li>Typically tapered</li> <li>Small volume to aid transfer</li> <li>Low activity</li> </ul>
<b>PTV</b> 	Rapid heating and cooling, fast transfer to column-used for active compounds such as pesticides and large volume injections	<ul style="list-style-type: none"> <li>Small to aid sample transfer</li> <li>Good thermal properties for rapid heating &amp; cooling</li> <li>Siltek coating provides highly inert surface</li> </ul>

## GC Columns

Column Parameter	Parameters Affecting Resolution			Performance Changes
	Efficiency	Retention	Selectivity	
Column Length (m)	✓			Doubling column length increases resolution by ~ 40%
Internal Diameter (mm)	✓	✓		The smaller the column ID, the greater the efficiency and better the resolution
Film Thickness (µm)		✓		The thicker the film, the greater the retention, e.g. ideal for highly volatile compounds. The thinner the film, the sharper the peaks and lower the bleed
Stationary Phase Chemistry			✓	Altering the stationary phase can affect elution order and help separate closely, or co-eluting peaks

## GC Syringes

### Syringe Selection by Needle Tip Style

Needle Tip Style	Features / Applications
<b>Cone (Tapered tip)</b> 	Most versatile needle for autosampler use and resist coring of vial and inlet septa
<b>Bevel (Sharp tip)</b> 	Typically used for manual injections. The tip shape helps reduce septa coring
<b>Side Hole (Dome tip with a side hole for sample exit)</b> 	Usually used for headspace and large volume injections
<b>Blunt End or 90° (flat top)</b> 	Used for injectors that do not contain an inlet septa such as Merlin MicroSeal™
<b>Dual Gauge</b> 	Narrow gauge part suitable for megabore on-column injection. Wider part suitable for autosampler use

### Syringe Selection by Needle Gauge Size

- Gauge is a measure of the “thickness” of the needle
- The higher the gauge number, the thinner the needle e.g. a 23 gauge is thicker than a 26 gauge
- Suffix “s” e.g. 23s refers to a needle with a narrower internal diameter
- For on-column injection ensure that the column ID is greater than the needle gauge

## GC Ferrules

Material	Uses	Advantages	Limitations
100% Graphite	FID, NPD, high temperature	<ul style="list-style-type: none"> <li>Easy-to-use stable seal</li> <li>Higher temperature limit</li> <li>Can be easily removed</li> <li>Can be re-used</li> </ul>	<ul style="list-style-type: none"> <li>Not for MS or oxygen-sensitive detectors</li> <li>Soft, easily deformed or destroyed</li> <li>Possible system contamination</li> </ul>
85% Vespel / 15% Graphite	MS and oxygen-sensitive detectors	<ul style="list-style-type: none"> <li>Long lifetime</li> <li>High temperature limit</li> <li>MS compatible</li> </ul>	<ul style="list-style-type: none"> <li>Cannot be re-used</li> <li>Must be re-tightened after initial temperature cycles</li> </ul>
SilTite™ Metal	MS and oxygen-sensitive detectors	<ul style="list-style-type: none"> <li>Long lifetime</li> <li>High temperature limit</li> <li>MS compatible</li> </ul>	<ul style="list-style-type: none"> <li>Cannot be re-used</li> </ul>

# Gas Management

## Click-On Inline Filters

Easy-to-use format eliminates contamination

- Pure gas output 99.9999% or 6.0 grade
- No carrier gas line contamination during filter change
- Easy and fast replacement without the need for tools
- TUEV approved
- Maximum pressure 11 bar (160 psi)
- Maximum flow 25L/min



Filters	For Gas	Indicator Change	Filter Capacity (Click-On Inline)	Filter Capacity (Super Clean)
Moisture	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR, Air		21g H <sub>2</sub> O	7.2g H <sub>2</sub> O
Oxygen	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR		3L O <sub>2</sub>	1L O <sub>2</sub>
Hydrocarbon	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR, Air		36g (as n-butane)	24g (as n-butane)
Combi – Moisture, Oxygen	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR		10g H <sub>2</sub> O, 1.5L O <sub>2</sub>	–
Combi – Moisture, Hydrocarbons	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR, Air		10g H <sub>2</sub> O, 18g HCs (as n-butane)	3.5g H <sub>2</sub> O, 12g HCs (as n-butane)
Triple – Moisture, Oxygen, Hydrocarbons	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR		6g H <sub>2</sub> O, 1L O <sub>2</sub> , 12g HCs (as n-butane)	1.8g H <sub>2</sub> O, 500mL O <sub>2</sub> , 7g HCs (as n-butane)
Triple – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC/MS	He		6g H <sub>2</sub> O, 1L O <sub>2</sub> , 12g HCs (as n-butane)	–
Indicating Triple – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC/MS	He	<b>Moisture:</b> Yellow to Clear <b>Oxygen:</b> Green to Gray	0.1g H <sub>2</sub> O, 100mL O <sub>2</sub> , 0.07g HCs (as n-butane)	–

### Click-On Inline Filters

Type	Cat No.	Quantity
Moisture Filter	<b>60180-801</b>	1 Each
Oxygen Filter	<b>60180-802</b>	1 Each
Hydrocarbon Filter	<b>60180-803</b>	1 Each
Combi – Moisture, Oxygen	<b>60180-804</b>	1 Each
Combi – Moisture, Hydrocarbons	<b>60180-843</b>	1 Each
Triple – Moisture, Oxygen, Hydrocarbons	<b>60180-805</b>	1 Each
Triple – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC/MS	<b>60180-806</b>	1 Each
Indicating Triple – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC/MS	<b>60180-808</b>	1 Each

### Connectors and Accessories

Description	Cat No.	Quantity
Brass End Fitting, 0.125in.	<b>60180-809</b>	2 Pack
Steel End Fitting, 0.125in.	<b>60180-810</b>	2 Pack
Brass End Fitting, 0.25in.	<b>60180-811</b>	2 Pack
Steel End Fitting, 0.25in.	<b>60180-812</b>	2 Pack
Double Ended Connector to connect Filter to Indicator	<b>60180-813</b>	1 Each
Replacement O-Rings	<b>60180-833</b>	1 Each
Wall Mounting Clamp	<b>60180-834</b>	4 Pack

## Super Clean Cartridge Filters

Replace easily without tools

- 99.9999% pure gas (or 6.0 grade) output
- No carrier gas line contamination during cartridge change
- Cost effective
- TUEV approved
- Max. pressure 11 bar (160 psi)
- Max. flow 7L/min



### Super Clean Cartridge Filters

Type	Base Included	Cat. No.	Quantity
Indicating Moisture Cartridge Filter	No	<b>60180-819</b>	1 Each
Indicating Oxygen Cartridge Filter	No	<b>60180-820</b>	1 Each
Hydrocarbon Cartridge Filter	No	<b>60180-821</b>	1 Each
Indicating Combi Filter – Moisture, Hydrocarbons	No	<b>60180-826</b>	1 Each
Indicating Triple Filter – Moisture, Oxygen, Hydrocarbons	No	<b>60180-824</b>	1 Each
Indicating Triple Filter – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC-MS	No	<b>60180-825</b>	1 Each
Triple Filter – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC-MS	Yes	<b>60180-830</b>	1 Each
Indicating Triple Filter – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC-MS	Yes	<b>60180-829</b>	1 Each
3 Cartridge Pack – contains 1 x Triple Filter and 2 x Combi Filter (Moisture, Hydrocarbons)	No	<b>60180-822</b>	1 Each
4 Cartridge Pack – contains 1 x Moisture Filter, 1 x O <sub>2</sub> Filter and 2 x Hydrocarbon Filter	Yes	<b>60180-827</b>	1 Each
3 Cartridge Pack – contains 1 x Triple Filter and 2 x Combi Filter (Moisture, Hydrocarbons)	Yes	<b>60180-828</b>	1 Each
High Flow Pack of 2 x Hydrocarbon Filters for LC-MS – no Indicator	No	<b>60180-839</b>	1 Each
High Flow Pack of 2 x Moisture Filters for LC-MS – with Indicator	No	<b>60180-841</b>	1 Each

## Super Clean Cartridge Filter Baseplates

One-time installation procedure

- Can be configured to the individual user requirements
- Needle valves ensure gas line is not contaminated during cartridge change

*Filters are not included*



Type	For Use With	For Gas
Single Base	Triple Filter	Carrier Gas Only
Dual Base	2 x Combi Filter	Air and Fuel Gas
Triple Base	Triple and 2 x Combi Filter	Carrier, Make-Up, and Fuel Gas
Four-position Base	Moisture, Oxygen, 2 x Hydrocarbon	High Capacity Carrier, Fuel, Make Up
Two-position, High-flow Base	N <sub>2</sub> in LC/MS, H <sub>2</sub> O in H <sub>2</sub> /air generators	Carrier, Make Up and Fuel

### Super Clean Cartridge Filter Baseplates

Type	Cat. No.	Quantity
Single Base	<b>60180-814</b>	1 Each
Dual Base	<b>60180-815</b>	1 Each
Triple Base	<b>60180-817</b>	1 Each
Four-position Base	<b>60180-818</b>	1 Each
O-rings for Base Plates	<b>60180-837</b>	20 Pack
Flush Cap	<b>60180-838</b>	2 Pack

## eVol XR Dispensing System

Allows precise and accurate, operator-independent dispensing for better deployment of laboratory staff

- Can be calibrated easily by user to ensure validity of results
- Intuitive interface with touch wheel and full-color screen
- Complies to GLP and GMP protocols
- Improves confidence in reported results
- Unifies two precision devices, a digitally controlled electronic drive and an XCHANGE™ analytical syringe
- Integrated XCHANGE coupling allows syringes to be quickly and easily changed
- XCHANGE syringes offer exceptional versatility and functionality

### eVol XR Dispensing System

Description	Cat. No.	Quantity
Sample Dispensing System	<b>66002-020</b>	1 Each
eVol™ XCHANGE Syringe 5µL	<b>66002-021</b>	1 Each
eVol XCHANGE Syringe 50µL	<b>66002-022</b>	1 Each
eVol XCHANGE Syringe 100µL	<b>66002-038</b>	1 Each
eVol XCHANGE Syringe 500µL	<b>66002-023</b>	1 Each
eVol XCHANGE Syringe 1000µL	<b>66002-039</b>	1 Each
Sample Dispensing System Kit*	<b>66002-024</b>	1 Each
eVol Stand	<b>66002-025</b>	1 Each
Charger for eVol System	<b>66002-026</b>	1 Each
Charging Stand for eVol System	<b>66002-027</b>	1 Each
Replacement Battery for eVol System	<b>66002-028</b>	1 Each
Replacement Plunger for 5µL eVol Syringe	<b>66002-029</b>	1 Each
Replacement Plunger for 50µL eVol Syringe	<b>66002-030</b>	1 Each
Replacement Plunger for 100µL eVol Syringe	<b>66002-040</b>	1 Each
Replacement Plunger for 500µL eVol Syringe	<b>66002-031</b>	1 Each
Replacement Plunger for 1000µL eVol Syringe	<b>66002-041</b>	1 Each

\* Sample Dispensing Kit contains 1 eVol XR unit, 1x5µL, 1x50µL and 1x500µL syringe.



### Applications:

- Routine dispensing of volatile solvents, hazardous, corrosive or viscous chemicals





## Syringes for GC Instruments

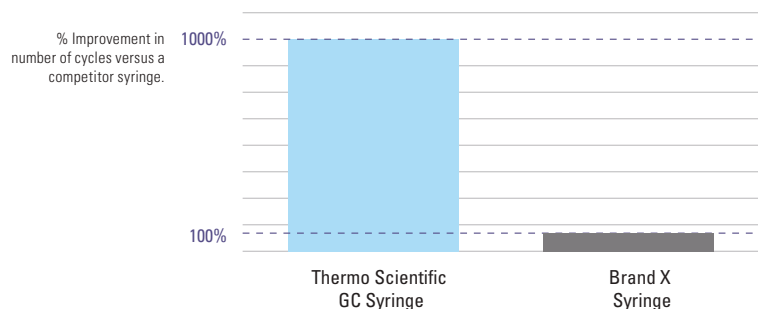
Providing durability, clarity and accuracy for your sample

Thermo Scientific™ syringes for GC instruments are designed to provide enhanced durability, clarity and accuracy in sample introduction. This gives confidence in analytical results, time-after-time.

### Durability in your GC Syringe

The enhanced design of the syringes delivers:

- Improved solvent resistance
- Greater temperature range
- Increased operational smoothness
- Longer lifetime and improved cycle life



### Clarity in your GC Syringe

Syringes are provided with a clear, easy-to-read black scale, which aids in consistent delivery of samples for manual syringes and easy identification of installed autosampler syringes.

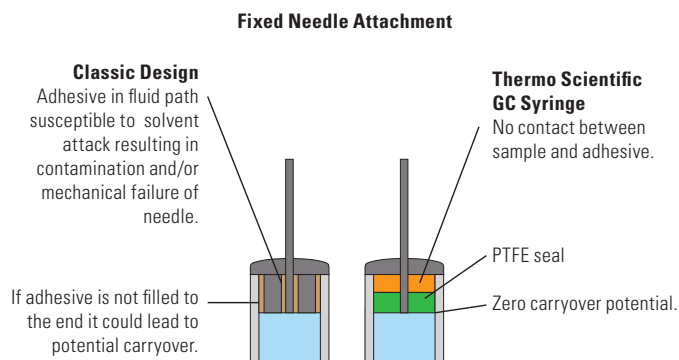


### Accuracy in your GC Syringe

The enhanced design of the syringe has eliminated areas where the sample can become trapped and potentially cause carryover:

- Closer fit between the plunger tip and PTFE insert at the zero position
- Tighter fit between PTFE insert and glass barrel
- Improved fixed needle attachment

In addition, the reduction in adhesive from the fluid path enhances durability and reduces the risk of sample interaction with the adhesive.



## GC Syringes for Thermo Scientific TriPlus RSH Autosampler

## Removable Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat. No.	Quantity	Repair Kit Cat. No.	Quantity
0.5	57	23	Cone	Split	<b>365A0241*</b>	1 Each	<b>365RN617</b>	1 Each
1	57	23	Cone	Split	<b>365B0251*</b>	1 Each	<b>365RN656</b>	1 Each

## Fixed Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat. No.	Quantity
5	85	23s	Cone	Merlin Valve SSL Injector: Splitless	<b>365C0221</b>	1 Each
	57	23s	Cone	Merlin Valve Injector: PTV and split	<b>365C0231*</b>	1 Each
	85	26s	Cone	Splitless and OC	<b>365C0241</b>	1 Each
	57	26s	Cone	Split and PTV	<b>365C0251*</b>	1 Each
10	85	23s	Cone	Merlin Valve SSL Injector: Splitless	<b>365D0261</b>	1 Each
	57	23s	Cone	Merlin Valve Injector: PTV and split	<b>365D0271*</b>	1 Each
	85	26s	Cone	Splitless and OC	<b>365D0281</b>	1 Each
	57	26s	Cone	Split and PTV	<b>365D0291*</b>	1 Each

## Fixed Needle, Gas Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat. No.	Quantity
10	85	23s	Cone	Merlin Valve SSL Injector: Splitless	<b>365D0301</b>	1 Each
	57	23s	Cone	Merlin Valve Injector: PTV and split	<b>365D0311*</b>	1 Each
	85	26s	Cone	Splitless and OC	<b>365D0321</b>	1 Each
	57	26s	Cone	Split and PTV	<b>365D0331*</b>	1 Each
25	85	23s	Cone	Merlin Valve SSL Injector: Splitless	<b>365F2431</b>	1 Each
	57	23s	Cone	Merlin Valve Injector: PTV and split	<b>365F2441*</b>	1 Each
	85	26s	Cone	Splitless and OC	<b>365F2451</b>	1 Each
	57	26s	Cone	Split and PTV	<b>365F2461*</b>	1 Each
50	57	23s	Cone	Merlin Valve SSL Injector: LV Splitless	<b>365G2311*</b>	1 Each
	85	26s	Cone	LV OC	<b>365G2321</b>	1 Each
	57	26s	Cone	LV Splitless	<b>365G2331*</b>	1 Each
100	57	23s	Cone	Merlin Valve SSL Injector: LV Splitless	<b>365H2141*</b>	1 Each
	85	26s	Cone	LV OC	<b>365H2151</b>	1 Each
	57	26s	Cone	LV Splitless	<b>365H2161*</b>	1 Each
	85	23	Side Hole	Variable depth LV PTV (w & w/o Merlin)	<b>365H2171</b>	1 Each
	57	23	Side Hole	LV PTV (with or without Merlin valve)	<b>365H2181*</b>	1 Each
250	85	26	Cone	LV OC	<b>365I2321</b>	1 Each
	57	26	Cone	LV Splitless	<b>365I2331</b>	1 Each
	85	23	Side Hole	Variable depth LV PTV (w & w/o Merlin)	<b>365I2341</b>	1 Each
	57	23	Side Hole	LV PTV (with or without Merlin valve)	<b>365I2351</b>	1 Each
500	85	26	Cone	LV OC	<b>365J2411</b>	1 Each
	57	26	Cone	Sample Dilution	<b>365J2421</b>	1 Each
	85	23	Side Hole	Variable depth LV PTV (w & w/o Merlin)	<b>365J2431</b>	1 Each
	57	23	Side Hole	LV PTV (with or without Merlin valve)	<b>365J2441</b>	1 Each
1000	65	23	Side Hole	Headspace	<b>365Q2121</b>	1 Each
	57	22	LC	Sample Dilution	<b>365K2811</b>	1 Each
2500	65	23	Side Hole	Headspace	<b>365Q2131</b>	1 Each
5000	65	22	Side Hole	Headspace	<b>365Q2141</b>	1 Each
10000	57	19	LC	Sample Dilution	<b>365N2721</b>	1 Each

\* Also suitable for use with the Thermo Scientific™ TriPlus™ 100LS Autosampler

## GC Syringes for Thermo Scientific Instruments

## Removable Needle, Gas Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat No.	Quantity	Replacement Needle Cat. No.	Quantity	Instrument Compatibility
10	75	31	Cone	Manual OC	<b>36500520</b>	1 Each	<b>36550046</b>	2 Pack	
100	50	23	Side hole	See Note	<b>36520050</b>	1 Each	<b>36550040</b>	2 Pack	TriPlus, AS200/AS800
100	50	23	Cone	LV Splitless	<b>36500495</b>	1 Each	<b>36566485</b>	5 Pack	TriPlus, AS2000, AS200/AS800
250	80	26	Cone	LVOC	<b>36500490</b>	1 Each	<b>36566480</b>	5 Pack	TriPlus, AS2000
250	50	23	Side hole	See Note	<b>36520051</b>	1 Each	<b>36550040</b>	2 Pack	TriPlus, AS2000, AS200/AS800
1000	50	23	Bevel		<b>365K3041</b>	1 Each	<b>365RN235</b>	5 Pack	AS200/AS800

## Removable Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat No.	Quantity	Replacement Needle Cat. No.	Quantity	Instrument Compatibility
5	75	31	Cone	Manual OC	<b>36500510</b>	1 Each	<b>36550045</b>	2 Pack	
10	50	26	Cone		<b>365D1841</b>	1 Each	<b>365RN362</b>	2 Pack	AS3000, AS2000
10	50	23	Cone		<b>365D3731</b>	1 Each	<b>365RN372</b>	2 Pack	AS3000, AS2000, AS200/AS800
50	50	23	Cone	LV Splitless	<b>36503015</b>	1 Each	<b>36566485</b>	5 Pack	AS2000

Syringe 36520051 is to be used when performing PTV/LVI injections with a dedicated liner for thermal labile compounds (liner 45352060). Compatible with Merlin Microseal device installed on BEST PTV and with AS2000 and TriPlus autosamplers for liquids.

## Fixed Needle, Gas Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat No.	Quantity	Instrument Compatibility
10	50	23	Cone		<b>365D3741</b>	1 Each	AS2000
100	50	25	Bevel		<b>365H2321</b>	1 Each	AS200/AS800
250	50	25	Bevel		<b>365I2561</b>	1 Each	AS200/AS800

## Fixed Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat No.	Quantity	Instrument Compatibility
5	50	26	Cone	Split/PTV	<b>36504047</b>	1 Each	TriPlus
5	50	23	Cone		<b>365C3701</b>	1 Each	AS3000, AS2000, AS200/AS800
5	50	26	Cone	Split/PTV	<b>36500505</b>	1 Each	AS3000, AS2000
5	80	26	Cone	Splitless and OC	<b>36502025</b>	1 Each	TriPlus
10	50	26	Cone		<b>365D3711</b>	1 Each	AS3000, AS200, AS200/AS800
10	50	26	Cone		<b>365D1856</b>	6 Pack	AS300, AS2000, AS200/AS800
10	50	25	Cone	Split/PTV	<b>36500525</b>	1 Each	TriPlus, AS3000, AS2000, AS200/AS800

**Fixed Needle Syringes (Continued)**

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat No.	Quantity	Instrument Compatibility
10	50	23	Cone	PTV/SSL Split	<b>36520060</b>	1 Each	TriPlus, AS300, AS2000, AS200/AS800
10	80	23	Cone	Merlin Valve SSL Splitless	<b>36520061</b>	1 Each	TriPlus, AS2000
10	50	23-26	Cone	OC in PTV Merlin Valve	<b>36500580</b>	1 Each	TriPlus, AS2000
10	80	26	Cone	OC and Splitless	<b>36502019</b>	1 Each	TriPlus, AS2000

**Plunger-in-Needle Syringes**

Volume (µL)	Length (mm)	Gauge	Tip Style	Type	Cat No.	Quantity	Instrument Compatibility
0.5	50	23	Cone	Split/PTV	<b>36504045</b>	1 Each	TriPlus, AS3000
0.5	75	31	Cone	Manual OC	<b>36500500</b>	1 Each	
0.5	80	26	Cone	Splitless and OC	<b>36504046</b>	1 Each	TriPlus

**GC Syringes for Agilent Instruments****Removable Needle Syringes**

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity	Replacement Needle Cat. No.	Quantity
10	42	23	Cone	<b>365D1611</b>	6 Pack	<b>365RN252</b>	2 Pack

**Fixed Needle, Gas Tight Syringes**

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
10	42	23-26	Cone	<b>365D0621</b>	1 Each
		23-26	Cone	<b>365D0626</b>	6 Pack

**Fixed Needle Syringes**

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
5	42	23	Cone	<b>365C0951</b>	1 Each
		23	Cone	<b>365C0956</b>	6 pack
		23-26s	Cone	<b>365C0971</b>	1 Each
		23-26s	Cone	<b>365C0976</b>	6 pack
10	42	23	Cone	<b>365D1571</b>	1 Each
		23	Cone	<b>365D1576</b>	6 pack
		23-26s	Cone	<b>365D1621</b>	1 Each
		23-26s	Cone	<b>365D1636</b>	6 pack

**Fixed Needle, Super-Elastic Plunger Syringes**

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
10	42	23-26s	Cone	<b>365D5416</b>	1 Each

## GC Syringes for Shimadzu Instruments

### Removable Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity	Replacement Needle Cat. No.	Quantity
5	42	26s	Cone	<b>365C6610</b>	1 Each	<b>365RN663</b>	2 Pack
		23s	Cone	<b>365C6620</b>	1 Each	<b>365RN661</b>	2 Pack
10	42	26s	Cone	<b>365D6610</b>	1 Each	<b>365RN272</b>	2 Pack
		23s	Cone	<b>365D6620</b>	1 Each	<b>365RN282</b>	2 Pack

## GC Syringes for CTC Instruments

### Removable Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity	Replacement Needle Cat. No.	Quantity
10	50	23	Cone	<b>365D3731</b>	1 Each	<b>365RN372</b>	2 Pack
		26	Cone	<b>365D1841</b>	1 Each	<b>365RN362</b>	2 Pack

### Fixed Needle, Gas Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
10	50	23	Cone	<b>365D2976</b>	6 Pack
		26	Cone	<b>365D2977</b>	1 Each
		23	Cone	<b>365D3741</b>	1 Each
25	50	23	Cone	<b>365F3761</b>	1 Each
100	50	23	Cone	<b>365H3771</b>	1 Each
250	50	26	Cone	<b>365H6700</b>	1 Each
1000	50	26	Side Hole	<b>365K8135</b>	1 Each
2500	50	26	Side Hole	<b>365L8635</b>	1 Each

### Fixed Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
5	50	23	Cone	<b>365C3701</b>	1 Each
		26	Cone	<b>36500505</b>	1 Each
10	50	26	Cone	<b>365D3711</b>	1 Each
		23	Cone	<b>36520060</b>	1 Each
		26	Cone	<b>365D1856</b>	6 Pack
		23	Cone	<b>365D2971</b>	6 Pack

## Manual GC Syringes

## Removable Needle, Gas Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity	Replacement Needle Cat. No.	Quantity
10	50	26s	Bevel	<b>365D0811</b>	1 Each	<b>365RN215</b>	5 Pack
25	50	25	Bevel	<b>365F1931</b>	1 Each	<b>365RN225</b>	5 Pack
		22s	Blunt End	<b>365FLG31</b>	1 Each	<b>365RNL25</b>	5 Pack
50	50	22s	Blunt End	<b>365GLG41</b>	1 Each	<b>365RNL25</b>	5 Pack
500	50	25	Bevel	<b>365J2881</b>	1 Each	<b>365RN225</b>	5 Pack
		22s	Blunt End	<b>365JLG71</b>	1 Each	<b>365RNL25</b>	5 Pack
1000	50	23	Bevel	<b>365K3041</b>	1 Each	<b>365RN235</b>	5 Pack
		22s	Blunt End	<b>365KLG81</b>	1 Each	<b>365RNL35</b>	5 Pack
5000	50	22	Bevel	<b>365M5212</b>	1 Each	<b>365RN463</b>	2 Pack
		22s	Blunt End	<b>365M6322</b>	1 Each	<b>365RN461</b>	2 Pack
		22s	Side Hole	<b>365M8922</b>	1 Each	<b>365RN465</b>	2 Pack
10000	50	22	Bevel	<b>365N5214</b>	1 Each	<b>365RN463</b>	2 Pack
		22s	Blunt End	<b>365N6323</b>	1 Each	<b>365RN461</b>	2 Pack
		22s	Side Hole	<b>365N8923</b>	1 Each	<b>365RN465</b>	2 Pack

## Removable Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity	Replacement Needle Cat. No.	Quantity
10	50	26	Bevel	<b>365D1171</b>	1 Each	<b>365RN215</b>	5 Pack
25	50	25	Bevel	<b>365F1901</b>	1 Each	<b>365RN225</b>	5 Pack
50	50	25	Bevel	<b>365G2091</b>	1 Each	<b>365RN225</b>	5 Pack

## Fixed Needle, Gas Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
10	50	26	Bevel	<b>365D4433</b>	1 Each
		26s	Blunt End	<b>365D6314</b>	1 Each
25	50	22s	Blunt End	<b>365F6315</b>	1 Each
50	50	25	Bevel	<b>365G2111</b>	1 Each
		22s	Blunt End	<b>365G6316</b>	1 Each
100	50	25	Bevel	<b>365H2321</b>	1 Each
		22s	Blunt End	<b>365H6317</b>	1 Each
250	50	25	Bevel	<b>365I2561</b>	1 Each
500	50	25	Bevel	<b>365J2831</b>	1 Each
		22s	Blunt End	<b>365J6319</b>	1 Each
1000	50	22	Bevel	<b>365K3051</b>	1 Each

## Fixed Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip Style	Cat. No.	Quantity
5	50	26	Bevel	<b>365C0741</b>	1 Each
		26	Bevel	<b>365C0746</b>	6 Pack
10	50	26	Bevel	<b>365D1091</b>	1 Each
		26	Bevel	<b>365D1096</b>	6 Pack
25	50	25	Bevel	<b>365F1891</b>	1 Each
100	50	25	Bevel	<b>365H2291</b>	1 Each

**PTFE Luer-Lok, Gas Tight Syringes**

Volume (µL)	Cat. No.	Quantity	Needle Cat. No.	Quantity
25	<b>365F7655</b>	1 Each	<b>365RNL22</b>	2 Pack
50	<b>365G7656</b>	1 Each	<b>365RNL22</b>	2 Pack
100	<b>365H7657</b>	1 Each	<b>365RNL22</b>	2 Pack
250	<b>365I7658</b>	1 Each	<b>365RNL22</b>	2 Pack
500	<b>365J7659</b>	1 Each	<b>365RNL22</b>	2 Pack
1000	<b>365KL531</b>	1 Each	<b>365RNL22</b>	2 Pack
2500	<b>365LL541</b>	1 Each	<b>365RNL22</b>	2 Pack
5000	<b>365ML551</b>	1 Each	<b>365RNL22</b>	2 Pack
10000	<b>365NL561</b>	1 Each	<b>365RNL22</b>	2 Pack
25000	<b>365PL571</b>	1 Each	<b>365RNL22</b>	2 Pack

Please note that the Luer-Lok syringes do not come with a needle and therefore the needle part number needs to be ordered separately

**Luer Tip, Gas Tight Syringes**

Volume (µL)	Cat. No.	Quantity
25	<b>365F7812</b>	1 Each
50	<b>365G7813</b>	1 Each
100	<b>365H7814</b>	1 Each
250	<b>365I7815</b>	1 Each
500	<b>365J7816</b>	1 Each
1000	<b>365K7817</b>	1 Each
2500	<b>365L7818</b>	1 Each
5000	<b>365M7819</b>	1 Each
10000	<b>365N7820</b>	1 Each



## Injection Port Septa

Quality materials for all applications

### BTO Septa

- Low bleed septa - ideal for MS applications
- Excellent mechanical properties
- Maximum temperature 400°C

### TR-Green Septa

- Long injection lifetime
- Low injection port adhesion
- Maximum temperature 350°C

### Marathon Septa

- Pre-pierced for reliable performance
- Up to 400 injections per septa
- Maximum temperature 350°C

### TR-Blue Septa

- General purpose septa
- Easy to penetrate
- Maximum temperature 200-250°C

### Septa

Material	ID (mm)	Cat. No. (Blister Pack)	Quantity (Blister Pack)	Cat. No. (Glass Jar)	Quantity (Glass Jar)
BTO	9	31303240-BP	50 Pack	31303240	50 Pack
BTO	11	31303233-BP	50 Pack	31303233	50 Pack
BTO	11.5	31303230-BP	50 Pack	31303230	50 Pack
BTO	12.7	31303250-BP	48 Pack	31303228	50 Pack
BTO	17	31303215-BP	48 Pack	31303211	50 Pack
TR-Green	9	313G3240-BP	50 Pack	313G3240	50 Pack
TR-Green	11	313G3230-BP	50 Pack	313G3230	50 Pack
TR-Green	12.7	313G3250-BP	48 Pack	313G3228	50 Pack
TR-Green	17	313G3215-BP	48 Pack	313G3211	50 Pack
Marathon	9	313P3240-BP	50 Pack	313P3240	50 Pack
Marathon	11	313P3233-BP	50 Pack	313P3233	50 Pack
Marathon	11.5	313P3230-BP	50 Pack	313P3230	50 Pack
Marathon	17	313P3215-BP	48 Pack	313P3211	50 Pack
TR-Blue	9	N/A	N/A	313B3240	50 Pack
TR-Blue	11	N/A	N/A	313B3233	50 Pack
TR-Blue	11.5	N/A	N/A	313B3230	50 Pack
TR-Blue	17	N/A	N/A	313B3211	50 Pack





## Gold and Siltek Inlet Base Seals

- Precision machined to provide exceptional sealing properties
- Gold plating and Siltek coatings provide a surface with exceptional inertness for analysis of highly active compounds
- High grade stainless steel providing reproducible seal
- Compatible with Thermo Scientific TRACE 1300 Series GC & Agilent split/splitless injection ports

### Gold Inlet Base Seals

For Use With	ID (mm)	Cat. No.	Quantity
Single Column Installation	0.8	<b>290GA081</b>	10 Pack
Single Column Installation	0.8	<b>290GA082</b>	2 Pack
Single Column Installation (Cross Version)	0.8	<b>290GA084</b>	10 Pack
Single Column Installation (Cross Version)	0.8	<b>290GA083</b>	2 Pack
Dual Column Installation	1.2	<b>290GA121</b>	10 Pack
Dual Column Installation	1.2	<b>290GA122</b>	2 Pack

### Siltek Inlet Base Seals

For Use With	ID (mm)	Cat. No.	Quantity
Single Column Installation	0.8	<b>290GA091</b>	10 Pack
Single Column Installation	0.8	<b>290GA092</b>	2 Pack
Single Column Installation (Cross Version)	0.8	<b>290GA094</b>	10 Pack
Single Column Installation (Cross Version)	0.8	<b>290GA093</b>	2 Pack



# Injection Port Liners

## LinerGOLD GC Liners

The GOLD standard in GC liner performance!

- **Increased accuracy and sensitivity in analysis** – LinerGOLD prevents the loss of sensitive compounds in analysis
- **Lower detection limits** – when analyzing active and sensitive compounds
- **Excellent reproducibility** – gives confidence in your results from liner to liner – setting the GOLD standard

### The GOLD standard in liner consistency

Consistency in your GC liner is of paramount importance – you expect to see a consistently high level of performance time after time. Thermo Scientific™ LinerGOLD™ GC liners are manufactured and tested to ensure that you have confidence with every liner that it installed onto your GC system.

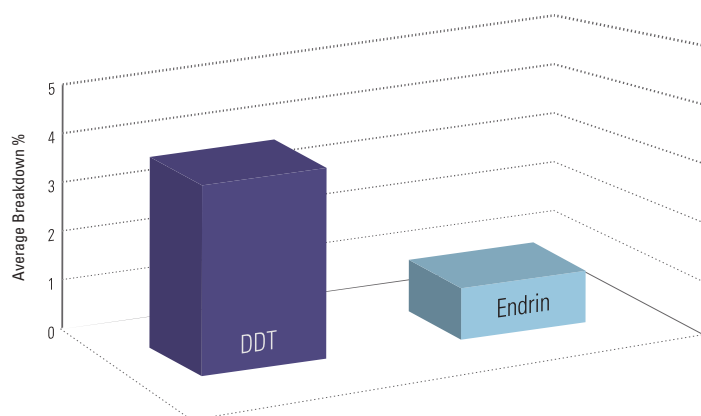


Figure 1: Endrin and DDT breakdown test results showing the lot-to-lot reproducibility and low levels of inertness of LinerGOLD

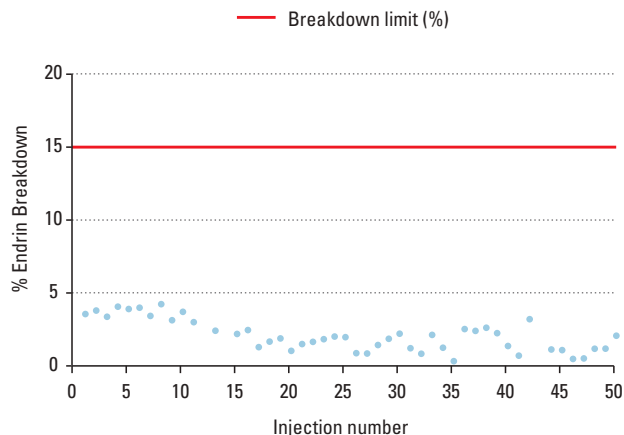
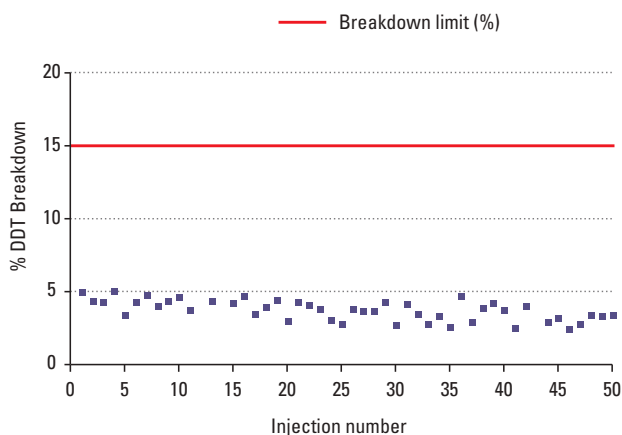
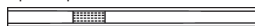

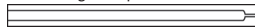



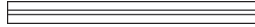
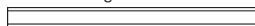
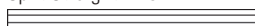

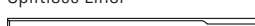





Figure 2: Compound degradation after 50 injections – LinerGOLD exhibits minimal breakdown

## LinerGOLD GC Liners for Thermo Scientific TRACE 1300 Series and Agilent Instruments

Injection Type	ID x OD (mm)	Length (mm)	Packing	Cat. No. 1 Pack	Cat. No. 5 Pack	Cat. No. 25 Pack
Split/Splitless Liner 	4 x 6.3	78.5	Quartz Wool	453A0164-UI	453A2265-UI	453A1262-UI
Split/Splitless Straight Liner 	4 x 6.3	78.5	No	453A0294-UI	453A1295-UI	453A2292-UI
Splitless Liner with Single Taper 	4 x 6.3	78.5	No	453A0344-UI	453A1345-UI	453A2342-UI
Splitless Liner with Single Taper 	4 x 6.3	78.5	Quartz Wool	453A0924-UI	453A1925-UI	453A2922-UI
Splitless Liner with Double Taper 	4 x 6.3	78.5	No	453A0354-UI	453A1355-UI	453A2352-UI
Precision Liner 	4 x 6.3	78.5	Quartz Wool	453A0254-UI	453A1255-UI	453A1252-UI
Direct Straight Liner 	1 x 6.3	78.5	No	453A0334-UI	453A1335-UI	453A2332-UI

## LinerGOLD GC Liners for Thermo Scientific TRACE Ultra and FOCUS Instruments

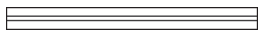
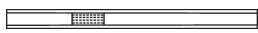





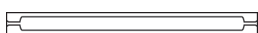
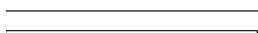
Injection Type	ID x OD (mm)	Length (mm)	Packing	Cat. No. 1 Pack	Cat. No. 5 Pack	Cat. No. 25 Pack
Direct Straight Liner 	5 x 8	105	No	45310030-UI	45350030-UI	45354030-UI
Split Straight Liner 	3 x 8	105	No	45310031-UI	45350031-UI	45354031-UI
Splitless Liner 	3 x 8	105	No	45310032-UI	45350032-UI	45354032-UI
Splitless Liner 	5 x 8	105	No	45351033-UI	45350033-UI	45354033-UI
Precision Liner 	5 x 8	105	Quartz Wool	453T0905-UI	453T1905-UI	453T4905-UI
Splitless Precision Liner 	5 x 8	105	Quartz Wool	453T0999-UI	453T2999-UI	453T4999-UI
Baffled PTV Liner 	2 x 2.75	120	No	453T0845-UI	453T2845-UI	453T4845-UI






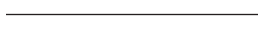



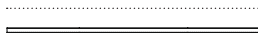
## Injection Port Liners for Thermo Scientific Instruments

Highly deactivated and produced to exacting tolerances to ensure a high degree of reproducibility

### Liners for Thermo Scientific TRACE 1300 Series SSL Instruments

	Injection Type	ID x OD (mm)	Length (mm)	Packing	Cat. No. 5 Pack	Cat. No. 25 Pack
	Direct Straight Liner	1.2 x 6.3	78.5	No	<b>453A1335</b>	<b>453A2332</b>
	Split Straight Liner	4 x 6.3	78.5	Quartz Wool	<b>453A2265</b>	<b>453A1262</b>
	Split Straight Liner	4 x 6.3	78.5	No	<b>453A1295</b>	<b>453A2292</b>
	Split/Splitless FocusLiner	4 x 6.3	78.5	Quartz Wool	<b>453A1255</b>	<b>453A1252</b>
	Split/Splitless FocusLiner with Single Taper	4 x 6.3	78.5	Quartz Wool	<b>453A1315</b>	<b>453A1312</b>
	Split/Splitless Liner with Single Taper	4 x 6.3	78.5	No	<b>453A1345</b>	<b>453A2342</b>
	Split/Splitless Liner with Double Taper	4 x 6.3	78.5	No	<b>453A1355</b>	<b>453A2352</b>
	Split/Splitless Liner w/ Recessed Gooseneck	4 x 6.3	78.5	Quartz Wool	<b>453A1305</b>	<b>N/A</b>
	Splitless Liner with Single Taper	4 x 6.3	78.5	Quartz Wool	<b>453A1925</b>	<b>N/A</b>
	Split/Splitless Mini-Lam Liner	4 x 6.3	78.5	No	<b>453A2009</b>	<b>N/A</b>
	Split/Splitless Mixed Liner Sample Pack	Mixed	Mixed	Mixed	<b>453TH002</b>	<b>N/A</b>



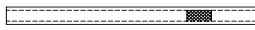








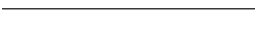
### Liners for Thermo Scientific TRACE 1300 Series and TRACE ULTRA PTV Instruments

	Injection Type	ID x OD (mm)	Length (mm)	Packing	Cat. No. 2 Pack	Cat. No. 5 Pack	Cat. No. 25 Pack
	PTV Straight Liner	1 x 2.75	120	No	<b>N/A</b>	<b>45352054</b>	<b>N/A</b>
	PTV Straight Liner	2 x 2.75	120	No	<b>N/A</b>	<b>45352057</b>	<b>45354057</b>
	PTV Straight Liner (deactivated)	2 x 2.75	120	No	<b>45322045</b>	<b>N/A</b>	<b>N/A</b>
	PTV Liner with Sintered Lining	1 x 2.75	120	No	<b>N/A</b>	<b>45352060</b>	<b>N/A</b>
	PTV Liner with Three Baffles	1 x 2.75	120	No	<b>N/A</b>	<b>45352062</b>	<b>N/A</b>
	PTV Siltek Metal Liner	1 x 2.75	120	No	<b>45322046</b>	<b>N/A</b>	<b>N/A</b>
	PTV Siltek Metal Liner	2 x 2.75	120	No	<b>45322044</b>	<b>N/A</b>	<b>N/A</b>
	PTV Siltek Metal Liner	2 x 2.75	120	Wool	<b>45322056</b>	<b>N/A</b>	<b>N/A</b>
	PTV Baffle Liner (Siltek)	2 x 2.75	120	No	<b>N/A</b>	<b>453T2120</b>	<b>N/A</b>
	PTV Split Liner with Recessed Gooseneck	2 x 2.75	120	Quartz Wool	<b>N/A</b>	<b>45352070</b>	<b>N/A</b>
	PTV Silcosteel Liner for OC	1 x 2.75	120	No	<b>45322052</b>	<b>N/A</b>	<b>N/A</b>
	PTV Mixed Liner Sample Pack	Mixed	Mixed	Mixed	<b>N/A</b>	<b>453TH003</b>	<b>N/A</b>

### Liner Sealing Rings for Thermo Scientific Instruments

Description	Cat. No.	Quantity
Liner Sealing Ring for TRACE 1300 Series GC SSL Injector	<b>29001312</b>	1 Each
Liner Sealing Ring for TRACE 1300 Series GC PTV Injector	<b>29001318</b>	1 Each
Viton Liner Sealing Ring for TRACE 1300 Series GC	<b>2900A241</b>	10 Pack
Liner sealing Ring for TRACE and FOCUS GC SSL Injector	<b>29033406</b>	10 Pack
Liner sealing Ring for TRACE PTV Injector	<b>29013417</b>	2 Pack


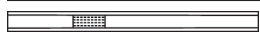
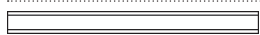

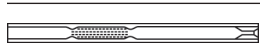
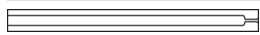

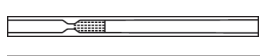
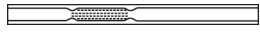
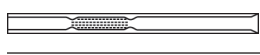


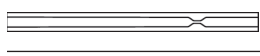



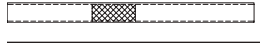

### Liners for Thermo Scientific TRACE ULTRA and FOCUS SSL Instruments

	Injection Type	ID x OD (mm)	Length (mm)	Packing	Cat. No. 5 Pack	Cat. No. 25 Pack
	Split Straight Liner	5 x 8	105	No	<b>45350030</b>	<b>45354030</b>
	Split Straight Liner	3 x 8	105	No	<b>45350031</b>	<b>45354031</b>
	Split Straight Liner	5 x 8	105	CarboFrit	<b>453T2131</b>	<b>N/A</b>
	Splitless Straight Liner	3 x 8	105	No	<b>45350032</b>	<b>45354032</b>
	Splitless Straight Liner	5 x 8	105	No	<b>45350033</b>	<b>45354033</b>
	Splitless Straight Liner	5 x 8	105	CarboFrit	<b>453T2130</b>	<b>N/A</b>
	Splitless Straight Liner (Siltek)	3 x 8	105	No	<b>453T2121</b>	<b>N/A</b>
	Split FocusLiner for 50mm Needle	5 x 8	105	Quartz Wool	<b>453T1905</b>	<b>453T4905</b>
	Splitless FocusLiner for 50mm Needle	5 x 8	105	Quartz Wool	<b>453T2999</b>	<b>453T4999</b>
	Splitless FocusLiner for 70mm Needle	5 x 8	105	Quartz Wool	<b>453T2895</b>	<b>453T4895</b>
	Baffle Liner	2 x 8	105	No	<b>453T1001</b>	<b>N/A</b>
	Split/Splitless Straight Liner	0.75 x 2.75	105	No	<b>45352083</b>	<b>N/A</b>



# Injection Port Liners for Agilent Instruments

## Liners for Agilent Instruments

	Injection Type	ID x OD (mm)	Length (mm)	Packing	Cat. No. 5 Pack	Cat No. 25 Pack
	Direct Straight Liner	1.2 x 6.3	78.5	No	<b>453A1335</b>	<b>453A2332</b>
	Split Straight Liner	4 x 6.3	78.5	Quartz Wool	<b>453A2265</b>	<b>453A1262</b>
	Split Straight Liner	4 x 6.3	78.5	No	<b>453A1295</b>	<b>453A2292</b>
	Split/Splitless FocusLiner	4 x 6.3	78.5	Quartz Wool	<b>453A1255</b>	<b>453A1252</b>
	Split/Splitless FocusLiner with Single Taper	4 x 6.3	78.5	Quartz Wool	<b>453A1315</b>	<b>453A1312</b>
	Split/Splitless Liner with Single Taper	4 x 6.3	78.5	No	<b>453A1345</b>	<b>453A2342</b>
	Split/Splitless Liner with Double Taper	4 x 6.3	78.5	No	<b>453A1355</b>	<b>453A2352</b>
	Split/Splitless Liner w/ Recessed Gooseneck	4 x 6.3	78.5	Quartz Wool	<b>453A1305</b>	<b>N/A</b>
	Split/Splitless FAST FocusLiner	2.3 x 6.3	78.5	Quartz Wool	<b>453A1285</b>	<b>453A2282</b>
	Split/Splitless FAST FocusLiner with Single Taper	2.3 x 6.3	78.5	Quartz Wool	<b>453A2375</b>	<b>453A1372</b>
	Splitless Liner with Single Taper	4 x 6.3	78.5	Quartz Wool	<b>453A1925</b>	<b>N/A</b>
	Splitless Straight Liner	2.0 x 6.3	78.5	No	<b>453A2275</b>	<b>N/A</b>
	Splitless Liner with Recessed Gooseneck	2.0 x 6.3	78.5	No	<b>453A2325</b>	<b>N/A</b>
	Cyclo/Single Gooseneck (Deactivated Metal)	5.2 x 6.3	78.5	No	<b>453A2000</b>	<b>N/A</b>
	Single Gooseneck (Deactivated Metal)	5.2 x 6.3	78.5	No	<b>453A2001</b>	<b>N/A</b>
	Cyclosplitter Liner (Deactivated Metal)	5.2 x 6.3	78.5	No	<b>453A2002</b>	<b>N/A</b>
	Split/Splitless Liner with Wool (Deactivated Metal)	5.2 x 6.3	78.5	No	<b>453A2003</b>	<b>N/A</b>
	Split/Splitless Mixed Liner Sample Pack	Mixed	Mixed	No	<b>453AG001</b>	<b>N/A</b>

## Liner Sealing Rings for Agilent Instrument

Description	Cat. No.	Quantity
Graphite Liner Sealing Ring for Agilent Direct Straight Liners	<b>290GA242</b>	10 Pack
Graphite Liner Sealing Ring for Agilent SSL Liners	<b>290GA243</b>	10 Pack
Graphite Liner Sealing Ring for Agilent 2.0mm Liners	<b>290GA244</b>	10 Pack
Viton Liner Sealing Ring for Agilent SSL Injector	<b>290OA241</b>	10 Pack

Thermo Scientific GC consumables are suitable for use with Agilent GC systems



## Ferrules

Wide range of choices for a wide range of instruments and applications

Thermo Scientific ferrules are available in three different materials and various dimensions to match the instrument and capillary column ID. The choice of material is dependent upon the use; guidelines are given in the table.

Material Type	Suitable for GC-MS	Temp Limit (°C)	Re-usable
Graphite	No	450	Yes
Graphite/Vespel	Yes	350	No
Stainless Steel (SiITite)	Yes	500	No

### 100% Graphite Ferrules



Thermo Scientific 100% graphite ferrules are a soft material that is porous to oxygen, making them suitable

for most applications except GC-MS interface connections. These easy-to-use ferrules form a soft grip with the column and provide a stable seal.

### 15% Graphite / 85% Vespel Ferrules



The mechanically robust 15% Graphite/85% Vespel ferrules have a long lifetime and are compatible with GC-MS. These

ferrules form a strong grip with the column and cannot be reused as they form a permanent seal with the column. They have a temperature limit of 350°C, but must be re-tightened after initial temperature cycles.

### SiITite Metal Ferrules



The SiITite ferrule forms a strong, permanent, airtight seal around the capillary column, eliminating leaks.

The base of the ferrule is flat and forms a perfect seal with the MS interface. The ferrule's temperature tolerance is well above the limit of the injector, MS interface or GC oven. Unlike other ferrules, SiITite Ferrules do not need re-tightening after installation.

*Please also see syringes on page 5-007.*

All varieties of ferrules are supplied in contaminant-free, individual blister packs, allowing removal of an individual item without risk of contamination to the other supplied items.

To select the most appropriate ferrule for your GC system, refer to the table below:

	100% Graphite	15% Graphite/ 85% Vespel	SiITite
Suitable for Thermo Scientific TRACE ULTRA SSL Injector	•	•	
Suitable for Thermo Scientific TRACE 1300/1310 & Agilent SSL Injectors	•	•	•
Suitable for Thermo Scientific TRACE ULTRA non-MS detectors	•	•	
Suitable for Thermo Scientific TRACE 1300/1310 & Agilent non-MS detectors	•	•	
Suitable for all Thermo Scientific & Agilent MS Detectors		•	•
Suitable for Thermo Scientific PTV Injector	•	•	

## Ferrules for Thermo Scientific Instruments

For Use with	Material Type	Ferrule Size (Column ID) (mm)	Cat. No.	Quantity	
Thermo Scientific TRACE 1300/1310 SSL injectors and non-MS detectors	100 % Graphite	0.1-0.32	<b>290GA139</b>	10 Pack	
		0.45-0.53	<b>290GA140</b>	10 Pack	
	15% Graphite/85% Vespel	0.1-0.25	<b>290VA191</b>	10 Pack	
		0.32	<b>290VA192</b>	10 Pack	
		0.53	<b>290VA193</b>	10 Pack	
Capillary Column Nut for injectors and non-MS Detectors	Stainless Steel		<b>35050458</b>	5 Pack	
Thermo Scientific TRACE Ultra SSL injectors and non-MS detectors	100 % Graphite	0.1-0.25	<b>29053488</b>	10 Pack	
		0.32	<b>29053487</b>	10 Pack	
		0.53	<b>29053486</b>	10 Pack	
	15% Graphite/85% Vespel	0.1-0.25	<b>29033461</b>	10 Pack	
		0.32	<b>29033460</b>	10 Pack	
		0.53	<b>29033471</b>	10 Pack	
			Packed Column 1/8" OD	<b>290VT168</b>	10 Pack
			Packed Column 1/4" OD	<b>290VT165</b>	10 Pack
	15% Graphite/85% Vespel (3.4mm length)	0.1-0.25	<b>290VT186</b>	10 Pack*	
		0.32	<b>290VT187</b>	10 Pack*	
0.53		<b>290VT188</b>	10 Pack*		
Capillary Column Nut for Graphite/Vespel Ferrules	Brass		<b>290BT239</b>	2 Pack	
All Thermo Scientific PTV injectors	100 % Graphite	0.1-0.25	<b>29053488</b>	10 Pack	
		0.32	<b>29053487</b>	10 Pack	
		0.53	<b>29053486</b>	10 Pack	
Thermo Scientific MS detectors	15% Graphite/85% Vespel	0.1-0.25	<b>29033496</b>	10 Pack	
		0.32	<b>29033497</b>	10 Pack	
Capillary Column Nut for MS Detectors	Brass		<b>290BT240</b>	5 Pack	
	Stainless Steel		<b>290BT241</b>	5 Pack	
SilTite Kit for Thermo Scientific TRACE 1300/1310 GC SSL injectors	SilTite Metal	0.1-0.25	<b>290MA215</b>	1 Each**	
		0.32	<b>290MA216</b>	1 Each**	
		0.53	<b>290MA217</b>	1 Each**	
SilTite Kit for Thermo Scientific ISQ GC-MS interface	SilTite Metal	0.1-0.25	<b>290MA194</b>	1 Each**	
		0.32	<b>290MA195</b>	1 Each**	
		0.53	<b>290MA196</b>	1 Each**	
Replacement SilTite Ferrules for Thermo Scientific TRACE 1300/1310 SSL and ISQ GC-MS interface kits	SilTite Metal	0.1-0.25	<b>290MA201</b>	10 Pack	
		0.32	<b>290MA202</b>	10 Pack	
		0.53	<b>290MA203</b>	10 Pack	
SilTite Nuts for MS interface			<b>290MA205</b>	5 Pack	
SilTite Nuts for SSL injectors			<b>290MA207</b>	5 Pack	
SilTite Kits for Thermo Scientific DSQ GC-MS interface	SilTite Metal	0.1-0.25	<b>290MT229</b>	1 Each**	
		0.32	<b>290MT230</b>	1 Each**	
		0.53	<b>290MT231</b>	1 Each**	
		Replacement SilTite Nuts	<b>290MT211</b>	5 Pack	
Replacement SilTite Ferrules for Thermo Scientific DSQ GC-MS interface kits	SilTite Metal	0.1-0.25	<b>290MT221</b>	10 Pack	
		0.32	<b>290MT222</b>	10 Pack	
		0.53	<b>290MT223</b>	10 Pack	

\* Vespel Ferrules must be used in conjunction with brass nut part number 290BT239

\*\* SilTite Kits contain 2 SilTite nuts and 10 ferrules



## Ferrules for Agilent Instruments

For Use with	Material Type	Ferrule Size (Column ID) (mm)	Cat. No.	Quantity
Agilent injectors and non-MS detectors	100 % Graphite	0.1-0.32	<b>290GA139</b>	10 Pack
		0.45-0.53	<b>290GA140</b>	10 Pack
		Packed Column 1/8" OD	<b>290GA108</b>	10 Pack
		Packed Column 1/4" OD	<b>290GA107</b>	10 Pack
	15% Graphite/85% Vespel	0.1-0.25	<b>290VA191</b>	10 Pack
		0.32	<b>290VA192</b>	10 Pack
		0.53	<b>290VA193</b>	10 Pack
		Packed Column 1/8" OD	<b>290VT168</b>	10 Pack
Packed Column 1/4" OD	<b>290VT165</b>	10 Pack		
Capillary Column Nut for injectors and non-MS Detectors	Stainless Steel		<b>35050458</b>	5 Pack
Agilent MS detectors	15% Graphite/85% Vespel	0.1-0.25	<b>29033496</b>	10 Pack
		0.32	<b>29033497</b>	10 Pack
		0.53	<b>290VP144</b>	10 Pack
SilTite Kits for Agilent SSL injectors	SilTite Metal	0.1-0.25	<b>290MA215</b>	1 Each*
		0.32	<b>290MA216</b>	1 Each*
		0.53	<b>290MA217</b>	1 Each*
SilTite Nuts for MS interface			<b>290MA205</b>	5 Pack
SilTite Kit for Agilent MS detectors	SilTite Metal	0.1-0.25	<b>290MA194</b>	1 Each**
		0.32	<b>290MA195</b>	1 Each**
		0.53	<b>290MA196</b>	1 Each**
Replacement SilTite Ferrules for all SilTite Kits	SilTite Metal	0.1-0.25	<b>290MA201</b>	10 Pack
		0.32	<b>290MA202</b>	10 Pack
		0.53	<b>290MA203</b>	10 Pack
SilTite Nuts for SSL injectors			<b>290MA207</b>	5 Pack
Replacement Baseplate Seals			<b>290MA227</b>	2 Pack
			<b>290MA228</b>	10 Pack

Thermo Scientific GC consumables are suitable for use with Agilent GC systems

\* Kit contains 2 nuts, 10 ferrules and 2 base seals

\*\* Kit contains 2 nuts and 10 ferrules



# Capillary Accessories

## SilTite $\mu$ -Union

The tiny connection for GC Columns

The SilTite  $\mu$ -Union is a connector for GC capillary columns, giving zero dead volume. The product has low thermal mass – it is only 9mm in length and has a mass <0.5g. It is available in kits to connect columns from 0.1mm ID to 0.53mm ID.

- Zero dead volume – giving optimized peak shapes
- FingerTite technology – easy to install and leak-free
- Highly inert and robust

Each SilTite  $\mu$ -Union kit contains the following:

- 5 x ferrules
- 2 x union fittings
- Installation jigs
- Installation instructions



### SilTite $\mu$ -Union Kits, Ferrules and Replacement Unions

Column ID (mm)	2nd Column ID (mm)	SilTite $\mu$ -Union Kit Cat. No. (1 Each)	SilTite $\mu$ -Union Ferrules Cat. No. (10 Pack)	SilTite $\mu$ -Union Replacement Union Cat. No. (1 Each)
0.1 – 0.25	0.1-0.25	<b>290SM301</b>	<b>290SM401</b>	<b>290SM321</b>
	0.32	<b>290SM302</b>	<b>290SM402</b>	<b>290SM321</b>
	0.53	<b>290SM303</b>	<b>290SM403</b>	<b>290SM322</b>
0.32	0.32	<b>290SM304</b>	<b>290SM404</b>	<b>290SM321</b>
	0.53	<b>290SM305</b>	<b>290SM405</b>	<b>290SM322</b>
0.53	0.53	<b>290SM306</b>	<b>290SM406</b>	<b>290SM323</b>

## SilTite Capillary Column Connectors

For use with capillary GC columns

- For fused silica capillary columns
- Glass lined for inertness
- Low thermal mass
- Each pack contains 1 Connector, 2 Nuts and 5 Ferrules

### SilTite Capillary Column Connectors and Ferrules

Column ID (mm)	2nd Column ID (mm)	SilTite Column Connector Kit Cat. No. (1 Each)	SilTite Ferrules Cat. No. (10 Pack)	Replacement SilTite Connector Nuts* Cat. No. (5 Pack)
0.1-0.25	0.1-0.25	<b>290MU498</b>	<b>290MF229</b>	<b>290MN211</b>
0.32	0.32-0.53	<b>290MU499</b>	<b>290MF230</b>	<b>290MN211</b>
0.53	0.45-0.53	<b>290MU500</b>	<b>290MF231</b>	<b>290MN211</b>

\* SilTite nuts must be used with SilTite ferrules

### GC Capillary Connectors

Description	Cat. No.	Quantity
Universal Capillary Connector	<b>64000-001</b>	1 Each
Y Capillary Connector	<b>64000-002</b>	1 Each

## Finger Tite Connectors

Easier fit, reliability and leak-free connections

- No need to re-tighten ferrules as they expand and contract with the fitting
- Easy to handle with the nut touchable even with a hot injector/detector
- No tools required



### Finger Tite Connectors for TRACE 1300 Series GC and Agilent GCs

Description	Cat. No.	Quantity
Male Nut	<b>290SA130</b>	5 Pack
Split/Splitless and MS Starter Kit	<b>290SA131</b>	1 Each
Split/Splitless and FID Starter Kit	<b>290SA132</b>	1 Each
Split/Splitless Injector Base Seal	<b>290SA133</b>	2 Pack
Ferrules for 0.1-0.25mm ID Columns	<b>290S1132</b>	10 Pack
Ferrules for 0.32mm ID Columns	<b>290S1131</b>	10 Pack

### Finger Tite Connectors for TRACE GC Ultra and FOCUS GCs

Description	Cat. No.	Quantity
Female Nut	<b>290ST130</b>	5 Pack
Split/Splitless and MS Starter Kit	<b>290ST131</b>	1 Each
Split/Splitless and FID Starter Kit	<b>290ST132</b>	1 Each
Split/Splitless and MS Starter Kit for ISQ	<b>290ST136</b>	1 Each
Ferrules for 0.1-0.25mm ID Columns	<b>290S1132</b>	10 Pack
Ferrules for 0.32mm ID Columns	<b>290S1131</b>	10 Pack

## Retention Gap Kits

Support Thermo Scientific gas chromatography consumables

- Kit contains one union and five ferrules
- Length of deactivated fused silica tubing



### Retention Gap Kits

Description	Cat. No.	Quantity	Replacement Union Cat. No.	Quantity
Retention Gap Kit, 0.22 – 0.32mm ID, 2m	<b>260RG497</b>	1 Each	<b>290GU498</b>	1 Each
Retention Gap Kit, 0.53mm ID, 2m	<b>260RG499</b>	1 Each	<b>290GU499</b>	1 Each
Retention Gap Kit, 0.53mm ID, 5m	<b>260RG500</b>	1 Each	<b>290GU499</b>	1 Each

### Deactivated Silica Tubing

Description	Cat. No.	Quantity
Deactivated silica tubing, 0.32mm ID; 2m Length	<b>260G498P</b>	1 Each
Deactivated silica tubing, 0.53mm ID; 2m Length	<b>260G499P</b>	1 Each
Deactivated silica tubing, 0.25mm ID; 5m Length	<b>260G495P</b>	1 Each
Deactivated silica tubing, 0.32mm ID; 5m Length	<b>260G496P</b>	1 Each
Deactivated silica tubing, 0.53mm ID; 5m Length	<b>260G500P</b>	1 Each
Deactivated silica tubing, 0.53mm ID; 1m Length (Siltek)	<b>260G401P</b>	1 Each

## Capillary GuardGOLD and HydroGOLD Columns

Providing protection to the analytical column

- Protects against column contamination caused by non-volatile materials, extending the column lifetime
- Focuses target analytes at the head of the analytical column, leading to better chromatographic peak shape
- Highly deactivated to provide superior inertness, essential for analysis of active compounds
- HydroGOLD extends column lifetime by preventing degradation from harsh “steam-cleaning” water injections

### Capillary GuardGOLD and HydroGOLD Columns

ID (mm)	Length (m)	GuardGOLD Cat. No.	Quantity	HydroGOLD Cat. No.	Quantity
0.18	2	<b>26050-0218</b>	1 Each	<b>26H50-0218</b>	1 Each
0.25	2	<b>26050-0225</b>	1 Each	<b>26H50-0225</b>	1 Each
0.32	2	<b>26050-0232</b>	1 Each	<b>26H50-0232</b>	1 Each
0.53	2	<b>26050-0253</b>	1 Each	<b>26H50-0253</b>	1 Each
0.18	5	<b>26050-0518</b>	1 Each	<b>26H50-0518</b>	1 Each
0.25	5	<b>26050-0525</b>	1 Each	<b>26H50-0525</b>	1 Each
0.32	5	<b>26050-0532</b>	1 Each	<b>26H50-0532</b>	1 Each
0.53	5	<b>26050-0553</b>	1 Each	<b>26H50-0553</b>	1 Each
0.18	10	<b>26050-1018</b>	1 Each	<b>26H50-1018</b>	1 Each
0.25	10	<b>26050-1025</b>	1 Each	<b>26H50-1025</b>	1 Each
0.32	10	<b>26050-1032</b>	1 Each	<b>26H50-1032</b>	1 Each
0.53	10	<b>26050-1053</b>	1 Each	<b>26H50-1053</b>	1 Each

## Capillary Column End Caps

Feature a universal fit to all GC capillary columns

- Eliminate column contamination caused by leaving a column unsealed or sealed with a septum
- Color-coordinated fittings ensure that the column is reinstalled the same way it came out
- Reusable



### Capillary Column End Caps

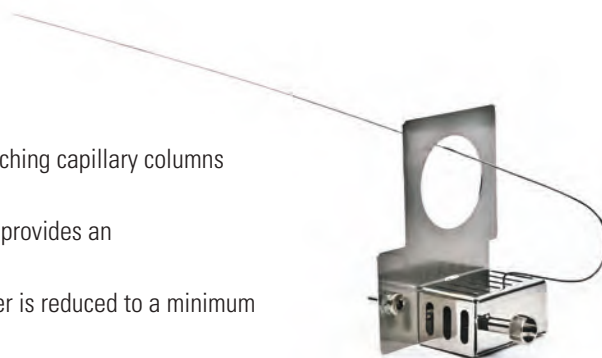
Description	Cat No.	Quantity
Capillary Column End Caps, Paired	<b>260EC111</b>	10 Pack

# SWAP-IT GC-MS Interface System

Easy to install for quick column changeovers

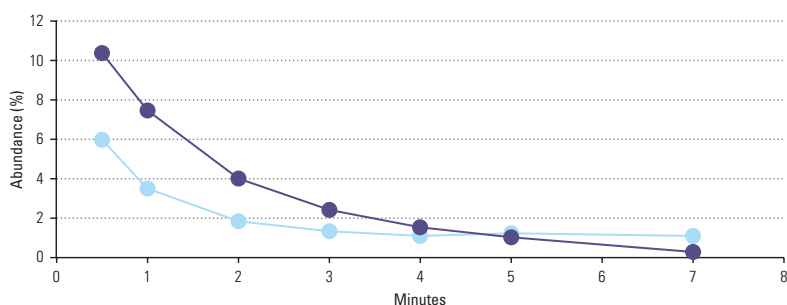
The SWAP-IT GC-MS Interface provides a powerful tool for switching capillary columns without the need to vent the MS

- Specially deactivated, robust stainless steel transfer capillary provides an interface between the analytical column and the MS detector
- Small ID of transfer capillary ensures exposure to air and water is reduced to a minimum during disconnection of the analytical column
- The system works without the requirement for additional He-purge
- Finger-tight connections make exchanging the analytical column quick and easy without the need for tools



## SWAP-IT GC-MS Interface System

Description	Cat. No.	Quantity
<b>For Thermo Scientific Instruments (ISQ GC-MS, TSQ 8000 GC-MS/MS)</b>		
SWAP-IT GC-MS Interface Kit: SWAP-IT GC-MS Interface, Nuts, Ferrules, Accessories	<b>60180-791</b>	1 Each
<b>For Thermo Scientific Instruments (DSQ GC-MS, DSQ II GC-MS, Polaris Q GC-MS, ITQ GC-MS only)</b>		
SWAP-IT GC-MS Interface Kit: SWAP-IT GC-MS Interface, Nuts, Ferrules, Accessories	<b>60180-790</b>	1 Each
SWAP-IT GC-MS Interface, SWAP-IT only	<b>60180-792</b>	1 Each
Transfer Line Nut	<b>290SG001</b>	1 Each
Graphite/Vespel Ferrule for Transfer Line	<b>290SG020</b>	10 Pack
<b>For Agilent Instruments</b>		
SWAP-IT GC-MS Interface Kit: SWAP-IT GC-MS Interface, Nuts, Ferrules, Accessories	<b>60180-794</b>	1 Each
SWAP-IT GC-MS Interface, SWAP-IT Only	<b>60180-796</b>	1 Each
Transfer Line Nut	<b>290SG004</b>	1 Each
Graphite/Vespel Ferrule for Transfer Line	<b>290SG021</b>	10 Pack
SWAP-Tight Nut and Adaptor for S/SL Injector	<b>290SG003</b>	1 Each
<b>Accessories</b>		
SWAP-Tight Nut	<b>290SG002</b>	1 Each
SWAP-Tight Ferrules, Blank	<b>290SG000</b>	10 Pack
SWAP-Tight Ferrules, 0.1 – 0.25mm	<b>290SG025</b>	10 Pack
SWAP-Tight Ferrules, 0.32mm	<b>290SG032</b>	10 Pack



● Mass 28, nitrogen  
● Mass 18, water

Removal of water and nitrogen to levels less than 2% is obtained within 3-4 minutes after column replacement

## 3-Port SilFlow Device

Switch your GC column without the need to vent

- Allows column switching in GC-MS without the need to vent
- Utilizes a make up gas module and a microfluidic device
- SilTite FingerTite fittings for easy set up and a reliable seal



### 3-Port SilFlow Device

Description	Cat. No.	Quantity
3 Port SilFlow MCD (0.25/0.32)	<b>60201-398</b>	1 Each

### 3-Port SilFlow Replacement Parts

Description	Cat. No.	Quantity
SilFlow Fingertight Ferrules for 0.25mm ID Columns	<b>29063466</b>	10 Pack
SilFlow Fingertight Ferrules for 0.32mm ID Columns	<b>29063467</b>	10 Pack
SilFlow Fingertight Tool	<b>60201-401</b>	1 Each
SilFlow Nuts	<b>290SF302</b>	10 Pack
Blanking Ferrule	<b>290ST414</b>	5 Pack
170µm Deactivated Tubing 0.363mm OD 60cm Length	<b>60201-390</b>	1 Each
75µm Untreated Fused Silica Tubing 0.363mm OD 30cm Length	<b>60201-391</b>	1 Each
170µm Deactivated Tubing 0.363mm OD 120cm Length	<b>60201-394</b>	1 Each
75µm Untreated Fused Silica Tubing 0.363mm OD 80cm Length	<b>60201-395</b>	1 Each

## GC Tubing

GC tubing for plumbing GC systems

### GC Tubing

Material	OD (in)	ID (in)	Length (ft)	Cat. No.	Quantity
Copper	1/8	0.065	50	<b>60181-632</b>	1 Each
	1/4	0.19	50	<b>60181-633</b>	1 Each
Stainless Steel	1/16	0.01	25	<b>60181-634</b>	1 Each
		0.02	25	<b>60181-635</b>	1 Each
		0.03	25	<b>60181-636</b>	1 Each
		0.04	25	<b>60181-637</b>	1 Each
	1/8	0.085	25	<b>60181-638</b>	1 Each
	1/4	0.21	25	<b>60181-639</b>	1 Each

## GC Tools

Support GC applications

### GC Tools

Description	Cat. No.	Quantity
Straight-Tipped Forceps	<b>60180-770</b>	1 Each
Angle-Tipped Forceps	<b>60180-771</b>	1 Each
Pin Vice	<b>60180-772</b>	1 Each
Pick-Up Tool	<b>60180-777</b>	1 Each
0.35mm Drill Bit	<b>60180-779</b>	1 Each
0.45mm Drill Bit	<b>60180-780</b>	1 Each
0.70mm Drill Bit	<b>60180-781</b>	1 Each
Adjustable Spanner	<b>60180-782</b>	1 Each
Tri-Scale Ruler	<b>60180-783</b>	1 Each
Shortix Capillary Column Cutter	<b>60180-835</b>	1 Each
Shortix Capillary Column Cutter Repair Kit	<b>60180-836</b>	1 Each
Ceramic Column Cutter	<b>60201-318</b>	1 Each



## GC Tool Kits

Includes: Wrench sets, flashlight, brushes, mini-drill set and other tools for maintaining your GC system performance

### GC Tool Kits

Description	Cat. No.	Quantity
Capillary Tool Kit for Thermo Scientific GCs	<b>60180-784</b>	1 Each
Capillary Tool Kit for Agilent GCs	<b>60180-786</b>	1 Each

## GC Installation Kit

Includes:

- Tubing cutter
- 1/8 x 1/4in. reamer
- 7/16in. wrench
- 1/2in. wrench
- 1/8in. brass tees, 4
- 1/8in. brass nuts, 10
- Brass front and back ferrules, 10
- 15.2m instrument-grade, cleaned 1/8in. copper tubing



### GC Installation Kit

Description	Cat. No.	Quantity
GC Installation Kit	<b>60180-888</b>	1 Each

## GLD Pro Gas Leak Detector

Aids in quickly locating and identifying gas leaks

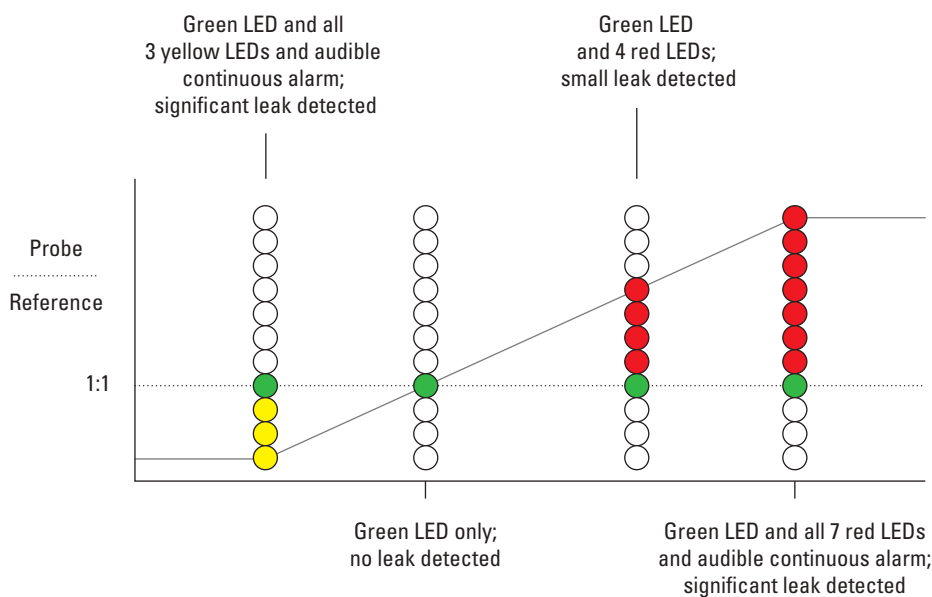
The Thermo Scientific™ GLD Pro™ Gas Leak Detector is specifically designed for use with gas chromatography instruments. Detection of leaks allows the user to reduce detector noise, provide a stable baseline, reduce carrier gas by minimizing waste, and maximize the lifetime of the analytical column by minimizing the presence of oxygen and other impurities in the carrier gas.

- Suitable for detection of a wide range of laboratory gases
- Push button on/off switch
- Push button zero function
- Automatic shutoff (5 minutes)
- LED light indicator for intensity of leak
- Rechargeable battery (up to 6 hrs. operation)
- Durable storage case
- Probe holder
- One year warranty



### GLD Pro Gas Leak Detector

Description	Cat. No.	Quantity
GLD Pro Leak Detector	<b>66002-001</b>	1 Each
Small Probe Adaptor	<b>66002-003</b>	1 Each
Soft-Sided Carry Case (Leak Detector not included)	<b>66002-002</b>	1 Each





## GFM Pro Electronic Flowmeter

Measure and monitor flow quickly and efficiently

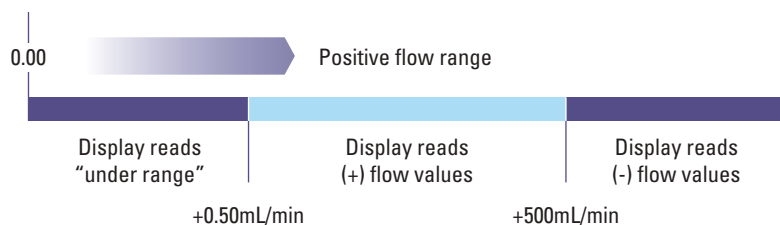
The Thermo Scientific™ GFM Pro™ Flowmeter is specifically designed for use with gas chromatography instruments. This versatile product is an electronic device capable of measuring volumetric flow for all types of gases. Real-time measurements can be made for various types of flow paths including continually changing gas types. The unit is portable so it can be hand-held or it also has an optional stand for bench-top convenience.

- Compact ergonomic design features side grips for added durability
- Easy-to-use interface features over-range warning indicator and auto-shutoff
- Measurement range of 0.5-500mL/min
- Accuracy of +/- 2% of flow or +/- 0.2mL/min, whichever is greater
- Data output via USB port
- Calibration: traceable to NIST primary standards
- Explosion-proof rating for flammable and explosive gases
- CE certified
- Uses 2-AA batteries
- Re-calibration service available



### GFM Pro Electronic Flowmeter

Description	Cat. No.	Quantity
GFM Pro Flowmeter	<b>66002-010</b>	1 Each
Soft-Sided Carry Case (Flowmeter not included)	<b>66002-002</b>	1 Each
GFM Pro Flowmeter Re-Calibration	<b>66002-GFMCAL</b>	1 Each







## GC Columns

A comprehensive column range providing excellent quality and performance, with guaranteed reproducibility

Get reliable, reproducible results for GC and GC-MS with our comprehensive portfolio of GC columns that meet all of your analytical needs.

- **TraceGOLD**  
Offering a leap forward in column performance delivering low bleed and superior inertness
- **TRACE**  
For excellent quality and reproducibility for a wide range of applications
- **UltraFast**  
Short, narrow-bore columns for use with the Thermo Scientific UltraFast instrument
- **TracePLOT**  
Providing reproducible analyses of permanent gases, hydrocarbons and solvents



The GC columns web page contains the latest news, applications and downloads for the range.

Visit [www.thermoscientific.com/columnsforgc](http://www.thermoscientific.com/columnsforgc)

# GC Columns

## Technical Resources



visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert) to access the following information:

- GC Column Selection
- GC Column Selection by Manufacturer
- GC Column Selection by US Pharmacopeia Specifications
- GC Column Selection by ASTM Method
- GC Column Selection by US EPA Drinking Water Test Method
- GC Column Selection by US EPA Waste Water Test Method
- GC Column Selection by US EPA Solid Water Test Method
- GC Column Selection by NIOSH Method
- GC Method Selection and Optimization
- GC Troubleshooting
- GC Equations
- Carrier Gas Choice
- Selection of Injection Method
- Column Conditioning



## TraceGOLD GC Columns

TraceGOLD GC columns offer you a leap forward in column performance delivering low bleed and superior inertness ideally suited to MS applications.


TG-1MS .....	<b>5-037</b>	TG-225MS .....	<b>5-051</b>
TG-5MS .....	<b>5-038</b>	TG-200MS .....	<b>5-052</b>
TG-5SiIMS .....	<b>5-038</b>	TG-WaxMS.....	<b>5-053</b>
TG-5MS AMINE .....	<b>5-040</b>	TG-WaxMS A.....	<b>5-054</b>
TG-5HT .....	<b>5-041</b>	TG-WaxMS B.....	<b>5-055</b>
TG-SQC.....	<b>5-045</b>	TG-POLAR.....	<b>5-056</b>
TG-35MS .....	<b>5-043</b>	TG-XLBMS .....	<b>5-057</b>
TG-35MS AMINE .....	<b>5-044</b>	TG-VRX.....	<b>5-058</b>
TG-1301MS .....	<b>5-045</b>	TG-VMS .....	<b>5-059</b>
TG-624 .....	<b>5-046</b>	TG-OCP I / TG OCP II .....	<b>5-060</b>
TG-624SiIMS .....	<b>5-047</b>	TG-OPP I / TG-OPP II.....	<b>5-061</b>
TG-1701MS .....	<b>5-048</b>	TG-ALC Plus I / TG-ALC Plus II.....	<b>5-062</b>
TG-17MS .....	<b>5-049</b>	TG-Dioxin .....	<b>5-063</b>
TG-17SiIMS .....	<b>5-050</b>		



## TraceGOLD TG-1MS GC Columns

Exceptionally low bleed for optimal signal-to-noise ratio, sensitivity and MS integrity

- Non-polar
- Equivalent to USP G2



Phase:	100% dimethyl polysiloxane
Max. Temps.:	330°C/350°C for Standard Columns 430°C for Metal Columns
USP Listing:	G2

### TraceGOLD TG-1MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	<b>26099-0200</b>	1 Each
0.20	12	0.33	<b>26099-5820</b>	1 Each
0.15	10	0.15	<b>26099-2750</b>	1 Each
	20	0.15	<b>26099-2760</b>	1 Each
	40	0.15	<b>26099-2940</b>	1 Each
0.18	20	0.18	<b>26099-5780</b>	1 Each
0.25	15	0.25	<b>26099-1300</b>	1 Each
		0.5	<b>26099-2110</b>	1 Each
		1.0	<b>26099-2840</b>	1 Each
	30	0.25	<b>26099-1420</b>	1 Each
		0.5	<b>26099-2230</b>	1 Each
		1.0	<b>26099-2960</b>	1 Each
	30 with 5m SafeGuard	0.25	<b>26099-1425</b>	1 Each
	60	0.25	<b>26099-1540</b>	1 Each
		0.5	<b>26099-2350</b>	1 Each
		1.0	<b>26099-3080</b>	1 Each
0.32	15	0.25	<b>26099-1310</b>	1 Each
		1.0	<b>26099-2850</b>	1 Each
		3.0	<b>26099-4840</b>	1 Each
	30	0.25	<b>26099-1430</b>	1 Each
		0.5	<b>26099-2240</b>	1 Each
		1.0	<b>26099-2970</b>	1 Each
		3.0	<b>26099-4840</b>	1 Each
		0.25	<b>26099-1550</b>	1 Each
		0.5	<b>26099-2360</b>	1 Each
	60	1.0	<b>26099-3090</b>	1 Each
		0.5	<b>26099-2130</b>	1 Each
		1.0	<b>26099-2860</b>	1 Each
0.53	15	1.5	<b>26099-3340</b>	1 Each
		0.5	<b>26099-2250</b>	1 Each
		1.0	<b>26099-2980</b>	1 Each
	30	1.5	<b>26099-3360</b>	1 Each
		1.0	<b>26099-2985</b>	1 Each
		1.0	<b>26099-2985</b>	1 Each
	30 with 5m SafeGuard	1.0	<b>26099-2985</b>	1 Each

### TraceGOLD TG-1MT Metal GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>26M99-1300</b>	1 Each
	30	0.25	<b>26M99-1420</b>	1 Each
0.53	5	0.1	<b>26M99-4130</b>	1 Each
		0.88	<b>26M99-4120</b>	1 Each
	6	0.15	<b>26M99-4100</b>	1 Each

### Applications:

- Hydrocarbons
- Solvent impurities
- PCB congeners
- Aroclor mixes
- Simulated distillation
- Drugs of abuse
- Natural gas odorants
- Essential oils
- Pesticides

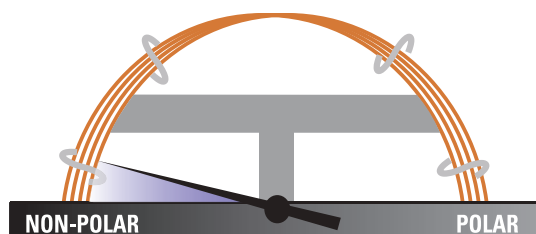
### Similar to:

- Rxi-1ms
- DB-1
- DB-1ms
- HP-1
- HP-1ms
- Ultra-1
- SPB-1
- Equity-1
- VF-1ms
- CP-Sil 5 CB Low Bleed/MS

## TraceGOLD TG-5MS GC Columns

The most widely used MS phase in gas chromatography

- Low polarity phase
- Low bleed for excellent signal-to-noise ratio, sensitivity and mass spectral integrity
- Exceptional inertness ideal for analysis of active compounds
- Equivalent to USP G27 phase



Phase:	5% diphenyl / 95% dimethyl polysiloxane
Max. Temps.:	330°C/350°C for Standard Columns 430°C for Metal Columns
USP Listing:	G27, G36

### TraceGOLD TG-5MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	<b>26098-0200</b>	1 Each
0.15	10	0.15	<b>26098-2750</b>	1 Each
		0.15	<b>26098-2760</b>	1 Each
		0.15	<b>26098-2940</b>	1 Each
0.18	20	0.18	<b>26098-5780</b>	1 Each
	20 with 5m SafeGuard	0.18	<b>26098-5785</b>	1 Each
0.25	10	0.25	<b>26098-1180</b>	1 Each
		0.25	<b>26098-1300</b>	1 Each
		1.0	<b>26098-2840</b>	1 Each
	15 with 5m SafeGuard	0.25	<b>26098-1305</b>	1 Each
		0.25	<b>26098-1420</b>	1 Each
		0.5	<b>26098-2230</b>	1 Each
	30 with 5m SafeGuard	1.0	<b>26098-2960</b>	1 Each
		0.1	<b>26098-0475</b>	1 Each
		0.25	<b>26098-1425</b>	1 Each
		0.25	<b>26098-1540</b>	1 Each
		0.5	<b>26098-2350</b>	1 Each
		1.0	<b>26098-3080</b>	1 Each
0.32	15	1.0	<b>26098-2850</b>	1 Each
		0.25	<b>26098-1430</b>	1 Each
		0.5	<b>26098-2240</b>	1 Each
	30 with 5m SafeGuard	1.0	<b>26098-2970</b>	1 Each
		0.25	<b>26098-1435</b>	1 Each
		0.25	<b>26098-1550</b>	1 Each
		0.5	<b>26098-2360</b>	1 Each
0.53	15	1.0	<b>26098-3090</b>	1 Each
		0.25	<b>26098-1320</b>	1 Each
		0.5	<b>26098-2130</b>	1 Each
		1.0	<b>26098-2860</b>	1 Each
		1.5	<b>26098-3340</b>	1 Each
	30	0.25	<b>26098-1440</b>	1 Each
		0.5	<b>26098-2250</b>	1 Each
		1.0	<b>26098-2980</b>	1 Each
		1.5	<b>26098-3360</b>	1 Each
		5.0	<b>26098-4100</b>	1 Each

### TraceGOLD TG-5MT Metal GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.1	<b>26M98-0350</b>	1 Each
		0.25	<b>26M98-1300</b>	1 Each
	30	0.25	<b>26M98-1420</b>	1 Each
		0.25	<b>26M98-1540</b>	1 Each

### Applications:

- Semi-volatiles
- Phenols
- Amines
- Residual solvents and solvent impurities
- Drugs of abuse
- Pesticides
- PCB congeners
- Aroclor mixes

### Similar to:

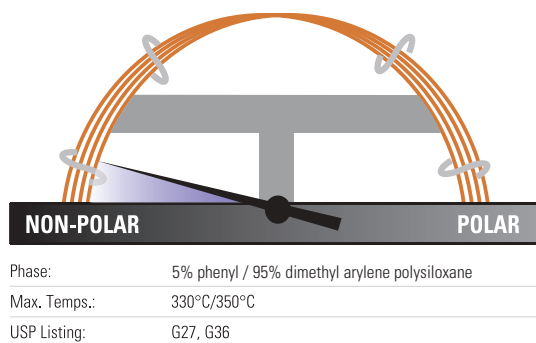
- Rxi-5ms
- DB-5
- HP-5
- HP-5ms
- Ultra-2
- SPB-5
- Equity-5
- CP-Sil 8



## TraceGOLD TG-5SiIMS GC Columns

Incorporate phenyl groups in the polymer backbone for improved thermal stability, reduced bleed and reduced susceptibility to oxidation

- Low polarity, silarylene phase
- Designed for low bleed and outstanding inertness



### TraceGOLD TG-5SiIMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.15	10	0.15	<b>26096-2750</b>	1 Each
	20	0.15	<b>26096-2760</b>	1 Each
	40	0.15	<b>26096-2940</b>	1 Each
0.18	20	0.18	<b>26096-5780</b>	1 Each
0.25	15	0.25	<b>26096-1300</b>	1 Each
		0.5	<b>26096-2110</b>	1 Each
	15 with 10m SafeGuard	0.25	<b>26096-1301</b>	1 Each
	30	0.25	<b>26096-1420</b>	1 Each
		0.5	<b>26096-2230</b>	1 Each
		1.0	<b>26096-2960</b>	1 Each
	30 with 5m SafeGuard	0.25	<b>26096-1425</b>	1 Each
		0.5	<b>26096-2235</b>	1 Each
	30 with 10m SafeGuard	0.25	<b>26096-1421</b>	1 Each
	60	0.25	<b>26096-1540</b>	1 Each
		1.0	<b>26096-3080</b>	1 Each
0.32	15	0.25	<b>26096-1310</b>	1 Each
		0.25	<b>26096-1430</b>	1 Each
	30	0.5	<b>26096-2240</b>	1 Each
		1.0	<b>26096-2970</b>	1 Each
0.53	30	1.5	<b>26096-3360</b>	1 Each

### Applications:

- GC-MS applications using ion-trap systems
- Polycyclic aromatics
- Hydrocarbons including chlorinated hydrocarbons
- Phthalates
- Phenols
- Amines
- Organophosphate

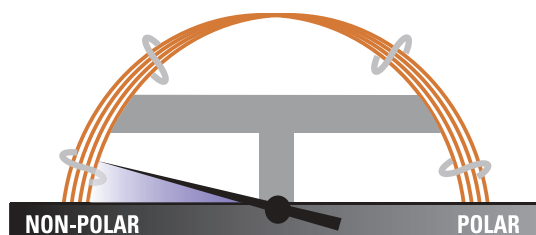
### Similar to:

- DB-5ms Ultra Inert
- VF-5ms
- CP-Sil 8 Low-Bleed/MS
- Rxi-5SiIMS
- BPX5
- ZB-5ms
- Optima-5MS
- SLB-5

## TraceGOLD TG-5MS AMINE GC Columns

Analysis of ppm levels of amines without column priming

- Low polarity phase, base optimized
- Tubing surface is chemically altered to reduce tailing of active basic compounds
- Also allows analysis of neutral or weakly acidic compounds (e.g. phenols) and compounds susceptible to hydrogen bonding
- Low bleed at maximum operating temperature



Phase:	Modified 5% diphenyl / 95% dimethyl polysiloxane for basic compounds
Max. Temps.:	300°C / 315°C
USP Listing:	N/A

### TraceGOLD TG-5MS AMINE GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>26097-1300</b>	1 Each
		1.0	<b>26097-2840</b>	1 Each
	30	0.25	<b>26097-1420</b>	1 Each
		0.5	<b>26097-2230</b>	1 Each
		1.0	<b>26097-2960</b>	1 Each
		1.0	<b>26097-2970</b>	1 Each
0.32	30	1.0	<b>26097-2970</b>	1 Each
0.53	15	1.0	<b>26097-2860</b>	1 Each
	30	1.0	<b>26097-2980</b>	1 Each
		3.0	<b>26097-3960</b>	1 Each

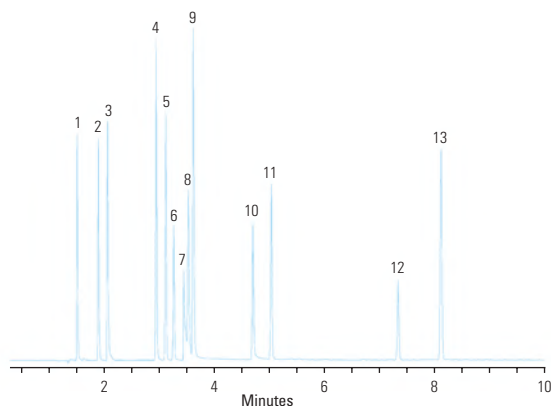
### Applications:

- Amines and other basic compounds, including alkylamines, diamines, triamines, ethanolamines
- Nitrogen-containing heterocyclics

### Similar to:

- Rtx-5 Amine

### Amines and phenols



#### TG-5MS Amine 30m x 0.32mm x 1.0µm

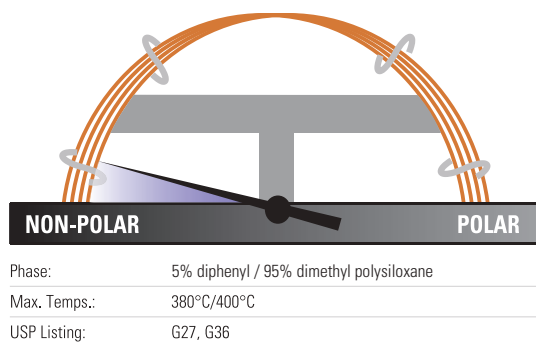
Temperature:	120°C to 220°C at 10°C/minute
Detector Type:	FID
Carrier Gas:	Hydrogen
Flow Rate:	40cm/min
Injection Volume:	1.0µL
Injection Mode:	Split 25:1, 300°C

- |                       |                           |
|-----------------------|---------------------------|
| 1. diethylamine       | 8. octylamine             |
| 2. pyridine           | 9. 1-methyl-2-pyrrolidone |
| 3. morpholine         | 10. 2-nitrophenol         |
| 4. phenol             | 11. 2,6-dimethylaniline   |
| 5. aniline            | 12. nicotine              |
| 6. 2-chlorophenol     | 13. 2-nitroaniline        |
| 7. diethylenetriamine |                           |

## TraceGOLD TG-5HT GC Columns

Offers extended operation up to 400°C, ideal for high temperature extended GC applications

- Low polarity
- Lower bleed and better inertness than comparable high-temperature columns
- Special design of fused silica tubing extends column lifetime by up to 40%



### TraceGOLD TG-5HT GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.1	<b>26095-0350</b>	1 Each
		0.25	<b>26095-1300</b>	1 Each
	30	0.1	<b>26095-0470</b>	1 Each
		0.25	<b>26095-1420</b>	1 Each
0.32	15	0.1	<b>26095-0360</b>	1 Each
	30	0.1	<b>26095-0480</b>	1 Each
		0.25	<b>26095-1430</b>	1 Each
0.53	10	0.15	<b>26095-1640</b>	1 Each
	30	0.15	<b>26095-0620</b>	1 Each

#### Applications:

- Phenols
- Residual solvents
- Solvents
- Semivolatiles
- Pesticides
- PCBs
- Solvent impurities

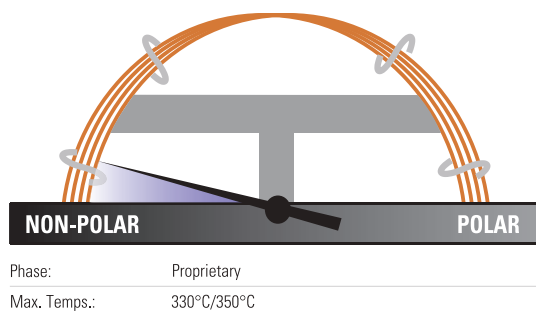
#### Similar to:

- Rxi-5HT
- BP-5HT
- VF-5HT
- ZB-5HT

## TraceGOLD TG-SQC GC Columns

Ensure the quality of a Thermo Scientific instrument when installed on site

- Optimized for system qualification tests for new GC-MS installations or during service/maintenance of an existing instrument
- We recommend reserving this column for benchmark testing only



### TraceGOLD TG-SQC GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>26070-1300</b>	1 Each
	30	0.25	<b>26070-1420</b>	1 Each

### Applications:

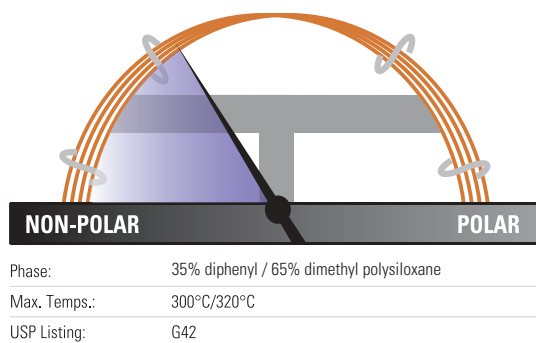
- System Qualification Tests (Thermo Scientific GC-MS)



## TraceGOLD TG-35MS GC Columns

Higher phenyl content for useful elution order and retention time changes

- Mid-polarity phase
- Equivalent to USP G42 phase



### TraceGOLD TG-35MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>26094-1300</b>	1 Each
		0.25	<b>26094-1420</b>	1 Each
		0.5	<b>26094-2230</b>	1 Each
0.32	15	0.25	<b>26094-1310</b>	1 Each
		0.5	<b>26094-2120</b>	1 Each
		0.25	<b>26094-1430</b>	1 Each
	30	0.5	<b>26094-2240</b>	1 Each
		0.5	<b>26094-2130</b>	1 Each
		1.0	<b>26094-2860</b>	1 Each
0.53	15	1.5	<b>26094-3340</b>	1 Each
		0.5	<b>26094-2250</b>	1 Each
		1.0	<b>26094-2980</b>	1 Each
	30	1.5	<b>26094-3360</b>	1 Each
		0.5		
		1.0		

#### Applications:

- Organochlorine pesticides and herbicides
- Pharmaceuticals
- PCB congeners
- Aroclor mixes
- Sterols
- Rosin acids
- Phthalate esters

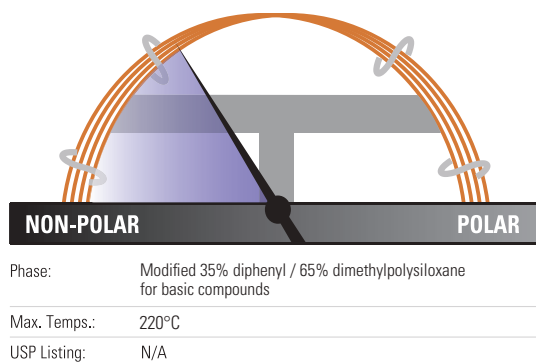
#### Similar to:

- Rtx-35
- BP-35
- HP-35
- SPB-35
- SPB-608

## TraceGOLD TG-35MS AMINE GC Columns

Chemically altered tubing surface reduces tailing and eliminates the need for column priming

- Mid-polarity phase, base optimized
- Developed for analysis of active basic compounds without derivatization
- Also allows analysis of neutral compounds and adsorptive compounds with oxygen groups susceptible to hydrogen bonding
- Low bleed at maximum operating temperature



### TraceGOLD TG-35MS AMINE GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	1.0	<b>26092-2840</b>	1 Each
	30	0.5	<b>26092-2230</b>	1 Each
		1.0	<b>26092-2960</b>	1 Each
0.32	15	1.0	<b>26092-2850</b>	1 Each
	30	1.0	<b>26092-2970</b>	1 Each
		1.5	<b>26092-3350</b>	1 Each
0.53	15	1.0	<b>26092-2860</b>	1 Each
	30	1.0	<b>26092-2980</b>	1 Each
		3.0	<b>26092-3960</b>	1 Each

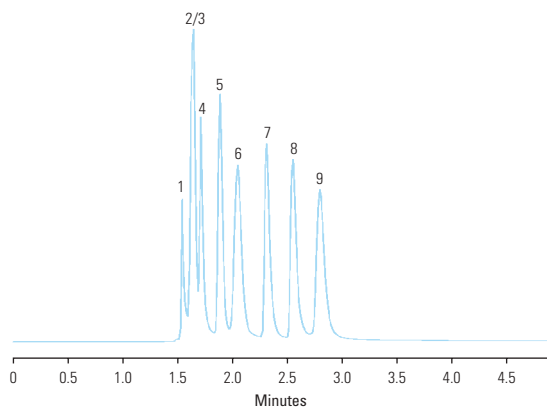
### Applications:

- Amines including alkylamines, diamines, triamines and ethanolamines
- Nitrogen-containing heterocyclics

### Similar to:

- Rtx-35 Amine

### Primary amines



#### TG-35MS AMINE 30m x 0.53mm x 1.0µm

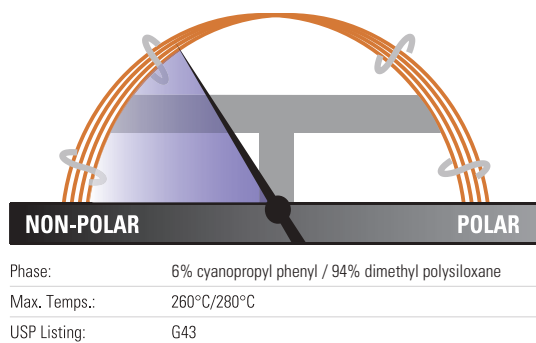
Temperature:	35°C (5 minute hold) Isothermal
Detector Type:	FID
Carrier Gas:	He
Flow Rate:	35cm/sec
Injection Volume:	1.0µL
Injection Mode:	Split (10:1), 250°C

1. methylamine	6. tert-butylamine
2. dimethylamine	7. n-propylamine
3. trimethylamine	8. diethylamine
4. ethylamine	9. sec-butylamine
5. isopropylamine	

## TraceGOLD TG-1301MS GC Columns

Low bleed, excellent reproducibility and column-to-column consistency even with sensitive detectors like ECD and MS

- Mid-polarity phase
- Long lifetime
- Excellent inertness
- Equivalent to USP G43 phase



### TraceGOLD TG-1301MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>26091-1300</b>	1 Each
		0.5	<b>26091-2110</b>	1 Each
	30	0.25	<b>26091-1420</b>	1 Each
		0.5	<b>26091-2230</b>	1 Each
		1.0	<b>26091-2960</b>	1 Each
	60	0.25	<b>26091-1540</b>	1 Each
1.0		<b>26091-3080</b>	1 Each	
0.32	15	0.25	<b>26091-1310</b>	1 Each
		0.25	<b>26091-1430</b>	1 Each
	30	0.5	<b>26091-2240</b>	1 Each
		1.0	<b>26091-2970</b>	1 Each
		1.5	<b>26091-3350</b>	1 Each
		1.8	<b>26091-3390</b>	1 Each
		0.5	<b>26091-2360</b>	1 Each
	60	1.0	<b>26091-3090</b>	1 Each
		1.8	<b>26091-3410</b>	1 Each
		0.25	<b>26091-1440</b>	1 Each
0.53	30	1.0	<b>26091-2980</b>	1 Each
		1.5	<b>26091-3360</b>	1 Each
		3.0	<b>26091-3960</b>	1 Each
	60	0.25	<b>26091-1560</b>	1 Each
		0.5	<b>26091-2370</b>	1 Each
		3.0	<b>26091-4080</b>	1 Each

### Applications:

- Alcohols
- Volatile organics
- Oxygenates
- Residual solvents

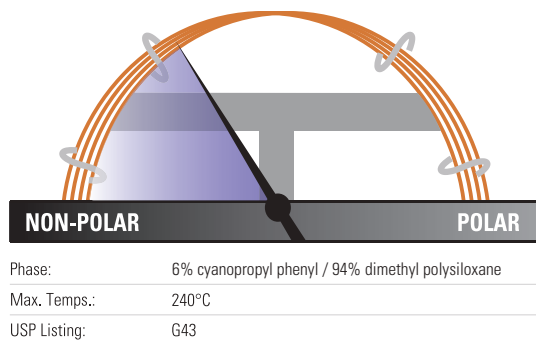
### Similar to:

- Rtx-1301
- DB-1301
- BP-624
- HP-1301
- HP-624
- SPB-1301
- SPB-624
- VP-1301
- BF-624ms
- CP-1301
- CP-Select 624 CB

## TraceGOLD TG-624 GC Columns

Offers 90+% resolution of the first six gases in EPA Method 8260 and EPA Method 524.2 for volatile organics analysis

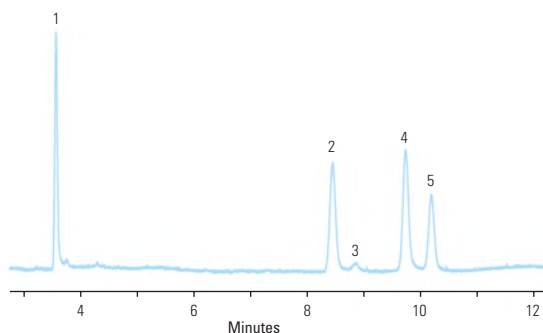
- Mid-polarity phase
- Ideal for EPA methods 624 and 608
- Allows resolution of 2-nitropropane from 1,1-dichloropropanone under EPA Method 524.2 revision IV



### TraceGOLD TG-624 GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	1.0	<b>26085-4950</b>	1 Each
	40	1.0	<b>26085-4960</b>	1 Each
0.25	30	1.4	<b>26085-3320</b>	1 Each
	60	1.4	<b>26085-3330</b>	1 Each
0.32	30	1.8	<b>26085-3390</b>	1 Each
	60	1.8	<b>26085-3410</b>	1 Each
0.53	30	3.0	<b>26085-3960</b>	1 Each
	60	3.0	<b>26085-4080</b>	1 Each
	75	3.0	<b>26085-4900</b>	1 Each
	105	3.0	<b>26085-4090</b>	1 Each

### Residual solvents class 1



#### TG-624 30m x 0.32mm x 1.80µm

Temperature: 40°C (20 minute hold) to 240°C at 10°C/min (20 minute hold)

Detector Type: FID

Carrier Gas: He

Flow Rate: 2.15mL/min

Injection Volume: 1µL

Injection Mode: Headspace, Split (1:5), 140°C

- 1,1-dichloroethane
- 1,1,1-trichloroethane
- carbon tetrachloride
- benzene
- 1,2-dichloroethane

### Applications:

- Residual Solvents
- Volatile Organic Compounds
- Alcohols
- Oxygenates

### Similar to:

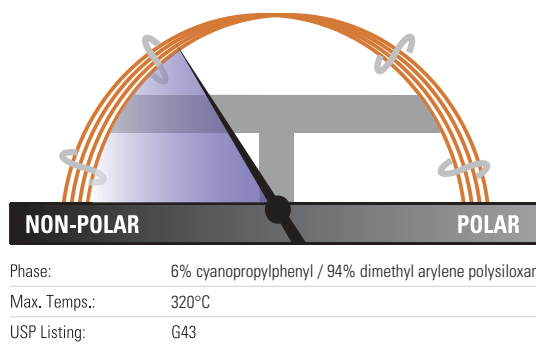
- DB-1301
- DB-624
- HP-1301
- HP-624
- SPB-1301
- SPB-624
- VF-1301
- VF-624ms
- CP-1301
- CP-Select 624 CB
- Rtx-624
- BP-624
- ZB-624
- Optima-1301
- Optima-624
- AT-624
- 007-1301



## TraceGOLD TG-624SiIMS GC Columns

High thermal stability column ideal for volatile organics analysis

- Mid-polarity phase
- High thermal stability – maximum temperatures up to 320°C
- Highly inert – excellent peak shape for a wide range of compounds



### TraceGOLD TG-624SiIMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	1.0	<b>26059-4950</b>	1 Each
0.25	30	1.4	<b>26059-3320</b>	1 Each
	60	1.4	<b>26059-3330</b>	1 Each
0.32	30	1.8	<b>26059-3390</b>	1 Each
	60	1.8	<b>26059-3410</b>	1 Each
0.53	30	3.0	<b>26059-3960</b>	1 Each
	60	3.0	<b>26059-4080</b>	1 Each
	75	3.0	<b>26059-4900</b>	1 Each
	105	3.0	<b>26059-4090</b>	1 Each

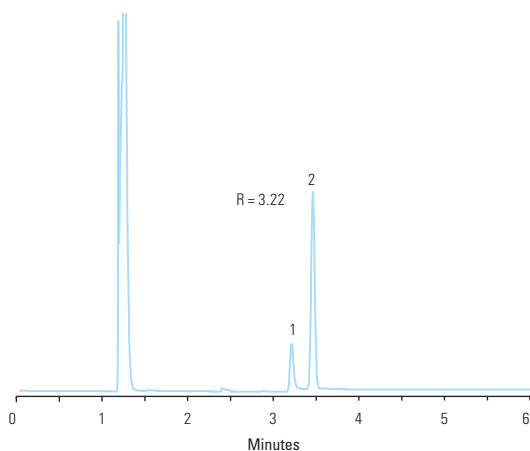
### Applications:

- Residual Solvents
- Volatile Organic Compounds
- Alcohols
- Oxygenates

### Similar to:

- DB-624 Ultra Inert
- VF-624ms
- CP-Select 624 CB
- ZB-624

### Acetonitrile and Dichloromethane



#### TG-624SiIMS 30m x 0.32mm x 1.8µm

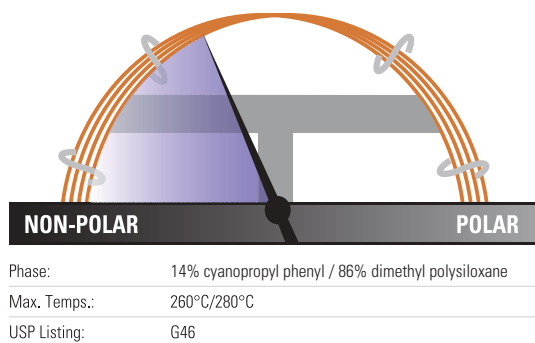
Temperature: 40°C for 6 minutes  
 Detector Type: MS (ISQ); m/z 40,41 for Acetonitrile (1), m/z 49, 84 for Dichloromethane (2)  
 Carrier Gas: Helium  
 Flow Rate: 1.5 mL/min  
 Injection Volume: 500µL  
 Injection Mode: Headspace, Split (20:1) 220°C

1. Acetonitrile
2. Dichloromethane

## TraceGOLD TG-1701MS GC Columns

Feature a mix of cyano and phenyl groups for increased polarity and a different elution order relative to less polar columns

- Mid-polarity phase, 14% cyanopropylphenyl methylpolysiloxane
- Fully characterized for long-term reproducibility, column-to-column consistency and low bleed
- Optimal for confirmation analysis
- Equivalent to USP G46 phase



### TraceGOLD TG-1701MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	<b>26090-0200</b>	1 Each
	0.25	15	0.25	<b>26090-1300</b>
0.25			<b>26090-1420</b>	1 Each
0.5		<b>26090-2230</b>	1 Each	
1.0		<b>26090-2960</b>	1 Each	
60		0.25	<b>26090-1540</b>	1 Each
		1.0	<b>26090-3080</b>	1 Each
0.32	15	0.25	<b>26090-1310</b>	1 Each
		0.25	<b>26090-1430</b>	1 Each
	30	0.5	<b>26090-2240</b>	1 Each
		1.0	<b>26090-2970</b>	1 Each
		60	0.25	<b>26090-1550</b>
		1.0	<b>26090-3090</b>	1 Each
0.53	15	0.25	<b>26090-1320</b>	1 Each
		0.25	<b>26090-1440</b>	1 Each
	30	0.5	<b>26090-2250</b>	1 Each
		1.0	<b>26090-2980</b>	1 Each
		3.0	<b>26090-3960</b>	1 Each

### Applications:

- Alcohols
- Pesticides
- Oxygenates
- PCB congeners
- Aroclor mixes

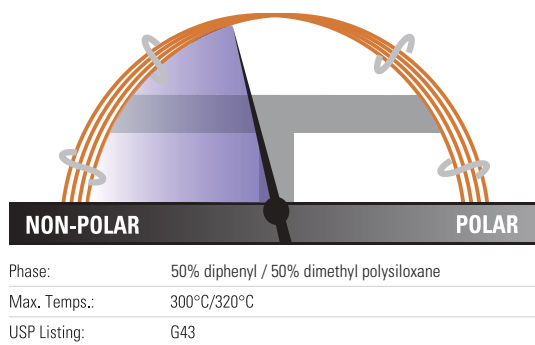
### Similar to:

- Rtx-1701
- DB-1701
- HP-1701
- SPB-1701
- VF-1701
- CP-Sil 19 CB

## TraceGOLD TG-17MS GC Columns

Particularly suited to GC-MS applications that require more polarity than a 5% phenyl phase

- Mid-polarity phase
- Ideal for confirmational analysis
- Excellent inertness for active compounds such as pesticides
- Very low bleed ideal for analysis by GC-MS



### TraceGOLD TG-17MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	<b>26089-0200</b>	1 Each
0.25	15	0.25	<b>26089-1300</b>	1 Each
		0.25	<b>26089-1420</b>	1 Each
		0.5	<b>26089-2230</b>	1 Each
		1.0	<b>26089-2960</b>	1 Each
		0.25	<b>26089-1540</b>	1 Each
0.32	15	0.25	<b>26089-1310</b>	1 Each
		0.25	<b>26089-1430</b>	1 Each
		0.5	<b>26089-2240</b>	1 Each
		1.0	<b>26089-2970</b>	1 Each
0.53	30	0.25	<b>26089-1440</b>	1 Each
		0.5	<b>26089-2250</b>	1 Each
		1.0	<b>26089-2980</b>	1 Each
		1.5	<b>26089-3360</b>	1 Each

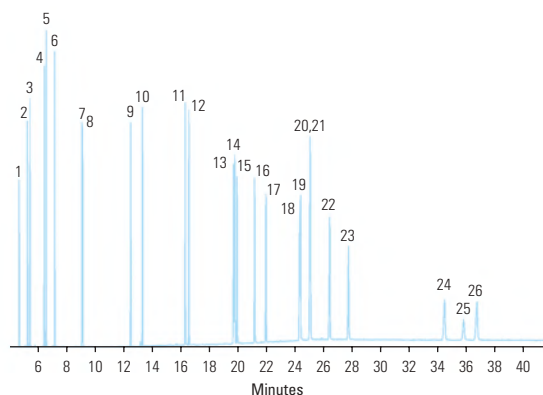
### Applications:

- Pesticides and herbicides
- Rosin acids
- Phthalate esters
- Triglycerides
- Sterols

### Similar to:

- Rxi-17
- DB-17
- DB-608
- VF-17ms
- CP-Sil 24 CB

### Polycyclic aromatic hydrocarbons



#### TG-17MS 30m x 0.25mm x 0.25µm

Temperature: 90°C (1.0 minute hold) to 215°C (0.5 minute hold) at 25°C/minute to 235°C at 4°C/minute to 280°C/minute at 15°C/minute to 320°C (20 minute hold) at 4°C/minute

Detector Type: MS

Carrier Gas: He

Flow Rate: 1.2mL/min

Injection Volume: 1.0µL

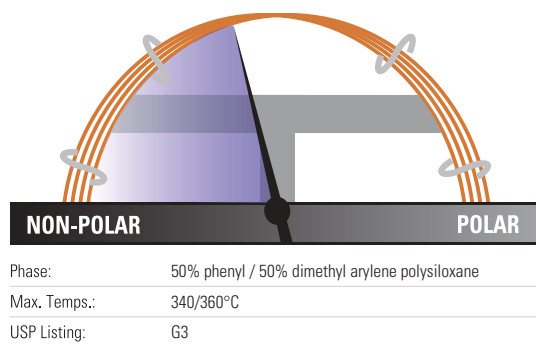
Injection Mode: Splitless, 300°C

- |                          |                              |
|--------------------------|------------------------------|
| 1. naphthalene           | 15. benzo(j)fluoranthene     |
| 2. 1-methylnaphthalene   | 16. benzo(a)pyrene           |
| 3. 2-methylnaphthalene   | 17. 3-methylcholanthrene     |
| 4. acenaphthylene        | 18. dibenzo(a,h)acridine     |
| 5. acenaphthene          | 19. dibenzo(a,j)acridine     |
| 6. fluorene              | 20. indeno(1,2,3-cd)pyrene   |
| 7. phenanthrene          | 21. dibenzo(a,h)anthracene   |
| 8. anthracene            | 22. benzo(ghi)perylene       |
| 9. fluoranthene          | 23. 7H-dibenzo(c,g)carbazole |
| 10. pyrene               | 24. dibenzo(a,e)pyrene       |
| 11. benzo(a)anthracene   | 25. dibenzo(a,i)pyrene       |
| 12. chrysene             | 26. dibenzo(a,h)pyrene       |
| 13. benzo(b)fluoranthene |                              |
| 14. benzo(k)fluoranthene |                              |

## TraceGOLD TG-17SiIMS GC Columns

Excellent separation of active environmental compounds

- Mid-polarity phase
- High thermal stability – maximum temperatures up to 340/360°C
- Excellent inertness for active environmental compounds such as PAHs



### TraceGOLD TG-17SiIMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.15	10	0.15	<b>26072-2750</b>	1 Each
	20	0.15	<b>26072-2760</b>	1 Each
0.18	20	0.18	<b>26072-5780</b>	1 Each
		0.36	<b>26072-1380</b>	1 Each
0.25	15	0.25	<b>26072-1300</b>	1 Each
	30	0.25	<b>26072-1420</b>	1 Each
0.32	15	0.25	<b>26072-1310</b>	1 Each
	30	0.25	<b>26072-1430</b>	1 Each

### Applications:

- PAHs
- Pesticides and herbicides
- Phthalate esters
- Triglycerides

### Similar to:

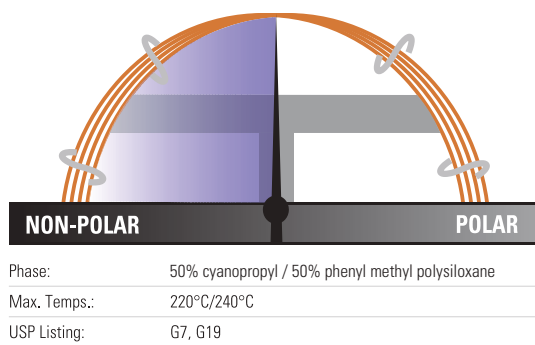
- DB-17ms
- VF-17ms
- CP-Sil 24 CB
- ZB-50
- BPX-50



## TraceGOLD TG-225MS GC Columns

Offers better thermal stability than comparable columns

- Polar phase
- Innovative deactivation process for siloxane reduces tailing and improves efficiency over comparable columns
- Equivalent to USP G7, G19 phases



### TraceGOLD TG-225MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>26083-1300</b>	1 Each
	30	0.25	<b>26083-1420</b>	1 Each
	60	0.25	<b>26083-1540</b>	1 Each
0.32	30	0.25	<b>26083-1430</b>	1 Each
		0.5	<b>26083-2240</b>	1 Each

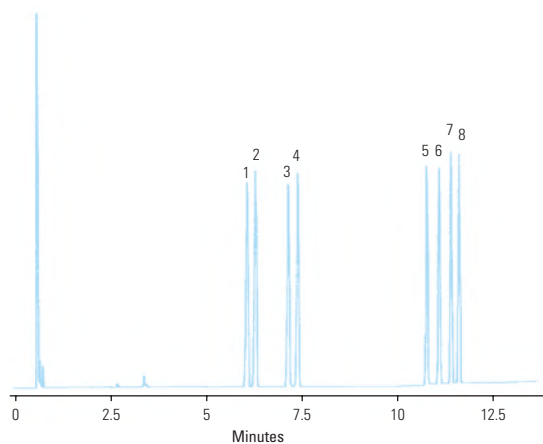
### Applications:

- FAMES
- Carbohydrates
- Sterols
- Flavor compounds

### Similar to:

- Rtx-225
- DB-225
- HP-225
- SPB-225

### Sugars



### TG-225MS 15m x 0.25mm x 0.25µm

Temperature: 190°C (5 minute hold) to 250°C at 8°C/min (5 minute hold)

Detector Type: FID

Carrier Gas: Hydrogen

Flow Rate: 45cm/sec

Injection Volume: 0.5µL

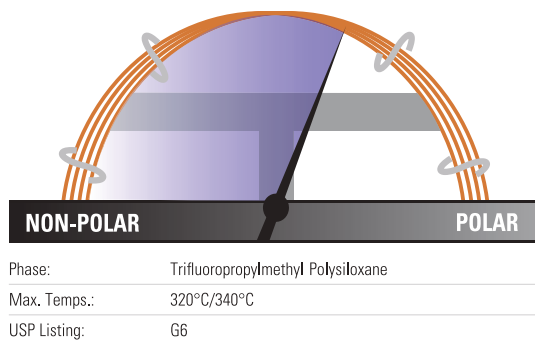
Injection Mode: Split (35:1), 260°C

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

## TraceGOLD TG-200MS GC Columns

Exceptionally inert mid-polarity columns with selectivity and elution order optimized for difficult separations

- Polar phase, trifluoropropyl methylpolysiloxane solid phase resolves compounds that phenyl and cyano phases cannot
- Outstanding thermal stability and low bleed
- Suitable for use with sensitive detectors including ECD, NPD and MS
- Confirmation column in combination with another GC column



### TraceGOLD TG-200MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.15	10	0.15	<b>26084-2750</b>	1 Each
	20	0.15	<b>26084-2760</b>	1 Each
0.25	30	0.25	<b>26084-1420</b>	1 Each
		0.5	<b>26084-2230</b>	1 Each
		1.0	<b>26084-2960</b>	1 Each
0.32	30	0.25	<b>26084-1430</b>	1 Each
		0.5	<b>26084-2240</b>	1 Each
		1.0	<b>26084-2970</b>	1 Each

### Applications:

- Solvents
- Fluorocarbons
- Alcohols and ketones
- Silanes
- Glycols

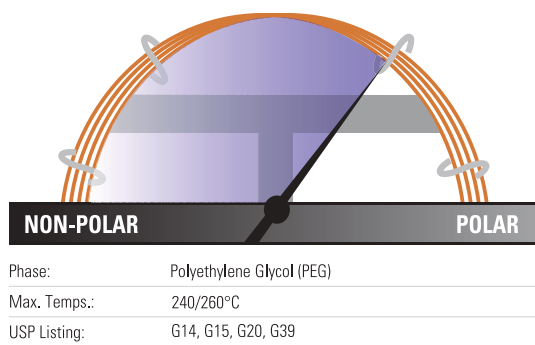
### Similar to:

- Rtx-200MS
- DB-200
- DB-210

# TraceGOLD TG-WaxMS GC Columns

Manufactured for better column-to-column reproducibility

- Polar phase, polyethylene glycol
- Polar-deactivated surface tightly binds polymer for excellent thermal stability
- Resists oxidative damage, damage from strongly acidic or basic volatiles better than silicone solid phases



## TraceGOLD TG-WaxMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity	
0.0	10	0.1	<b>26088-0200</b>	1 Each	
0.15	10	0.15	<b>26088-2750</b>	1 Each	
	20	0.15	<b>26088-2760</b>	1 Each	
	40	0.15	<b>26088-2940</b>	1 Each	
0.18	20	0.18	<b>26088-5780</b>	1 Each	
0.25	15	0.25	<b>26088-1300</b>	1 Each	
		0.25	<b>26088-1420</b>	1 Each	
	30	0.5	<b>26088-2230</b>	1 Each	
		0.25	<b>26088-1421</b>	1 Each	
		0.25	<b>26088-1540</b>	1 Each	
		0.5	<b>26088-2350</b>	1 Each	
0.32	15	0.25	<b>26088-1310</b>	1 Each	
		0.5	<b>26088-2120</b>	1 Each	
		1.0	<b>26088-2850</b>	1 Each	
	30	0.25	<b>26088-1430</b>	1 Each	
		0.5	<b>26088-2240</b>	1 Each	
		1.0	<b>26088-2970</b>	1 Each	
		30m with 5m SafeGuard	0.25	<b>26088-1435</b>	1 Each
		60	0.25	<b>26088-1550</b>	1 Each
			0.5	<b>26088-2360</b>	1 Each
	1.0		<b>26088-3090</b>	1 Each	
	0.53	15	0.5	<b>26088-2130</b>	1 Each
			1.0	<b>26088-2860</b>	1 Each
30			0.25	<b>26088-1440</b>	1 Each
30		0.5	<b>26088-2250</b>	1 Each	
		1.0	<b>26088-2980</b>	1 Each	
		1.5	<b>26088-3360</b>	1 Each	
		60	0.25	<b>26088-1560</b>	1 Each
			0.5	<b>26088-2370</b>	1 Each
			1.0	<b>26088-3100</b>	1 Each

### Applications:

- FAMES
- Flavor compounds and essential oils
- Solvents
- Xylene isomers
- EPA Method 603 for Acrolein/ Acrylonitrile

### Similar to:

- DB-WAX
- DB-WAXetr
- HP-Wax
- HP-Innowax
- Supelcowax 10
- CP-Wax 52 CB
- Stabilwax
- Rtx-Wax
- BP20
- ZB-Wax
- Optima Wax
- AT-Wax

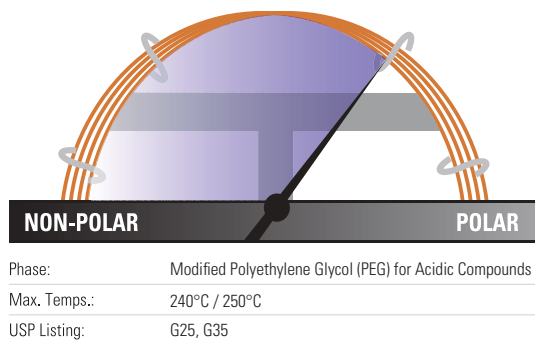
## TraceGOLD TG-WaxMT Metal GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	<b>26M88-1420</b>	1 Each
		0.5	<b>26M88-2230</b>	1 Each
	60	0.25	<b>26M88-1540</b>	1 Each
0.53	30	0.25	<b>26M88-1440</b>	1 Each
		0.5	<b>26M88-2250</b>	1 Each
		1.0	<b>26M88-2880</b>	1 Each
		1.5	<b>26M88-3360</b>	1 Each

## TraceGOLD TG-WaxMS A GC Columns

Acidic functionality in the polymer structure allows analysis of acidic compounds without derivatization

- Polar phase, acid-deactivated polyethylene glycol
- Resists oxidative damage and adsorption of acids
- Excellent peak shapes for high MW acids
- Equivalent to USP G25, G35 phases



### TraceGOLD TG-WaxMS A GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>26087-1300</b>	1 Each
		0.25	<b>26087-1420</b>	1 Each
	60	0.5	<b>26087-2230</b>	1 Each
		0.25	<b>26087-1540</b>	1 Each
		0.5	<b>26087-2350</b>	1 Each
0.32	15	0.25	<b>26087-1310</b>	1 Each
		0.5	<b>26087-2120</b>	1 Each
	30	0.25	<b>26087-1430</b>	1 Each
		0.5	<b>26087-2240</b>	1 Each
		1.0	<b>26087-2970</b>	1 Each
	60	0.25	<b>26087-1550</b>	1 Each
		0.5	<b>26087-2360</b>	1 Each
15		0.5	<b>26087-2130</b>	1 Each
		1.0	<b>26087-2860</b>	1 Each
30	0.25	<b>26087-1440</b>	1 Each	
	0.5	<b>26087-2250</b>	1 Each	
	1.0	<b>26087-2980</b>	1 Each	

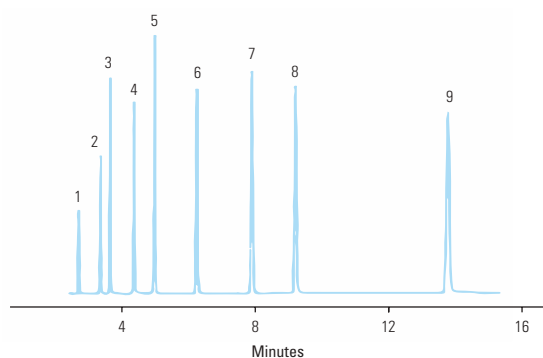
### Applications:

- Organic acids
- Free fatty acids
- Alcohols

### Similar to:

- DB-FFAP
- HP-FFAP
- NUKOL
- OV-351
- CP-Wax 58 CB
- FFAP
- Stabilwax-DA
- BP-21
- Optima FFAP

### Free fatty acids



#### TG-WaxMS A 30m x 0.25mm x 0.25µm

Temperature:	145°C Isothermal
Detector Type:	FID
Carrier Gas:	Hydrogen
Flow Rate:	40cm/sec
Injection Volume:	1.0µL
Injection Mode:	Split (50:1), 250°C

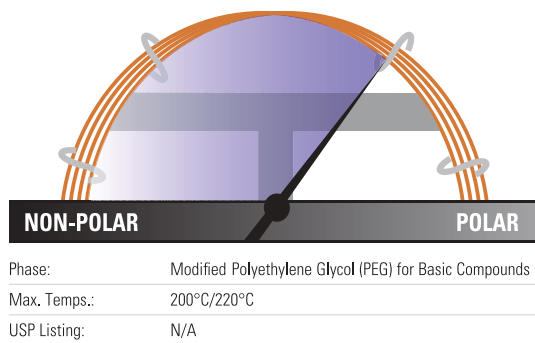
- |                    |                    |
|--------------------|--------------------|
| 1. acetic acid     | 7. isocaproic acid |
| 2. propionic acid  | 8. caproic acid    |
| 3. isobutyric acid | 9. heptanoic acid  |
| 4. n-butyric acid  |                    |
| 5. isovaleric acid |                    |
| 6. n-valeric acid  |                    |



## TraceGOLD TG-WaxMS B GC Columns

Base deactivation allows analysis of basic analytes without derivatization or column priming

- Polar phase, base deactivated polyethylene glycol
- Reduced absorption and improved responsiveness for basic compounds
- Not suitable for use with water or alcohols



### TraceGOLD TG-WaxMS B GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	<b>26086-1420</b>	1 Each
		0.5	<b>26086-2230</b>	1 Each
0.32	30	0.25	<b>26086-1430</b>	1 Each
		0.5	<b>26086-2240</b>	1 Each
		1.0	<b>26086-2970</b>	1 Each
		1.0	<b>26086-3090</b>	1 Each
0.53	30	0.5	<b>26086-2250</b>	1 Each
		1.0	<b>26086-2980</b>	1 Each

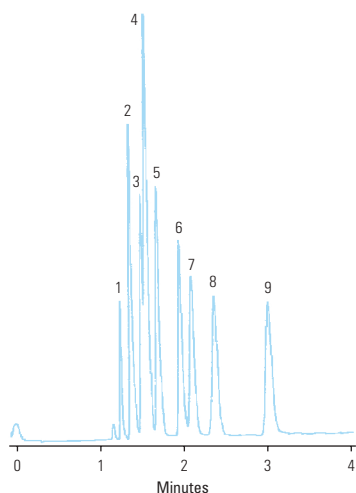
#### Applications:

- Amines
- Alkylamines
- Diamines
- Other basic compounds

#### Similar to:

- CAM
- Carbowax Amine
- CP Wax51
- Stabilwax-DB

### Amines



#### TG-WaxMS B 30m x 0.53mm x 1.0µm

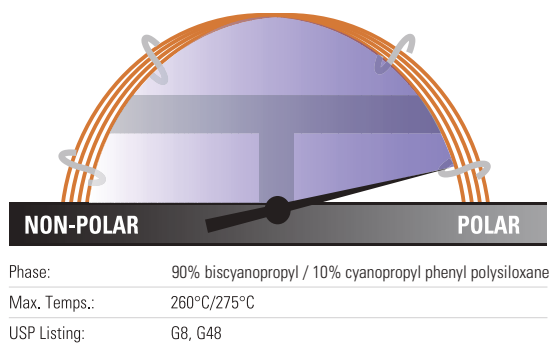
Temperature:	45°C Isothermal
Detector Type:	FID
Carrier Gas:	Hydrogen
Flow Rate:	40cm/sec
Injection Volume:	1µL
Injection Mode:	Direct Injection, 250°C

- |                   |                    |
|-------------------|--------------------|
| 1. trimethylamine | 7. tert-butylamine |
| 2. dimethylamine  | 8. diethylamine    |
| 3. ethylamine     | 9. sec-butylamine  |
| 4. methylamine    |                    |
| 5. isopropylamine |                    |
| 6. n-propylamine  |                    |

## TraceGOLD TG-POLAR GC Columns

Specifically designed polymer and surface treatment overcome traditional problems with high-polarity columns

- Highly polar phase
- Strong dipole moment and high selectivity for cis/trans compounds or compounds with conjugated double bonds
- Equivalent to USP G8 and G48



### TraceGOLD TG-POLAR GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.1	<b>26082-0470</b>	1 Each
		0.2	<b>26082-5010</b>	1 Each
	60	0.1	<b>26082-0590</b>	1 Each
		0.2	<b>26082-5020</b>	1 Each
	105	0.1	<b>26082-5000</b>	1 Each
		0.2	<b>26082-5030</b>	1 Each
0.32	30	0.2	<b>26082-5040</b>	1 Each
	60	0.2	<b>26082-5050</b>	1 Each
0.53	30	0.1	<b>26082-0490</b>	1 Each
		0.2	<b>26082-5070</b>	1 Each
	60	0.1	<b>26082-0610</b>	1 Each
		0.2	<b>26082-5080</b>	1 Each

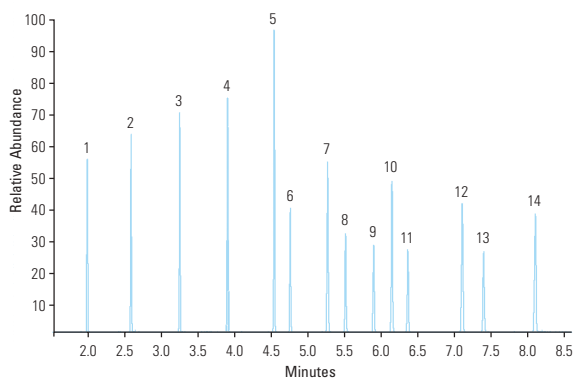
### Applications:

- Cis/Trans FAMES
- Dioxins

### Similar to:

- DB-23
- HP-23
- Rtx-2330
- SP-2330
- SP-2380
- SPB-2560
- HP-88
- Silar 10c
- CP-Sil 88 FAME
- CP-Sil 88
- BPX 70
- BPX 90

### FAMES C8-C24



### TG-POLAR 30m x 0.25mm x 0.2µm

Temperature: 100°C (0.5 minute hold) to 195°C at 25°C/minute (1 minute hold) to 250°C at 10°C/minute (3 minute hold)

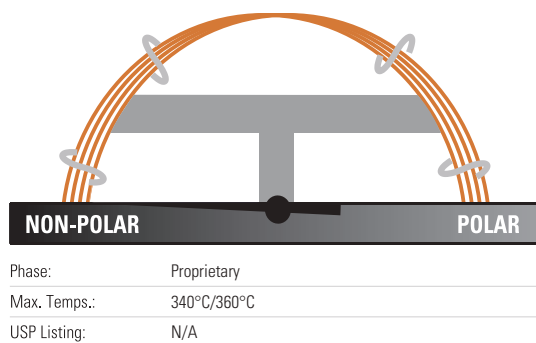
Detector Type: MS  
 Carrier Gas: He  
 Flow Rate: 1.2mL/min  
 Injection Volume: 0.1µL  
 Injection Mode: Split (100:1), 250°C

- |                        |                               |
|------------------------|-------------------------------|
| 1. Methyl octanoate    | 10. Methyl linolenate         |
| 2. Methyl decanoate    | 11. Methyl arachidate         |
| 3. Methyl decanoate    | 12. Methyl behenate           |
| 4. Methyl myristate    | 13. Methyl cis-13-docosenoate |
| 5. Methyl palmitate    | 14. Methyl tetracosanoate     |
| 6. Methyl palmitoleate |                               |
| 7. Methyl stearate     |                               |
| 8. Methyl oleate       |                               |
| 9. Methyl linoleate    |                               |

## TraceGOLD TG-XLBMS GC Columns

General purpose columns exhibiting extremely low bleed

- Low polarity phase, proprietary
- Low bleed for excellent signal-to-noise ratio, sensitivity and mass spectral integrity
- Ideal for analysis of active, high molecular weight compounds with sensitive GC-MS systems



### TraceGOLD TG-XLBMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	0.18	<b>26079-5780</b>	1 Each
0.25	15	0.1	<b>26079-0350</b>	1 Each
		0.25	<b>26079-1300</b>	1 Each
		0.1	<b>26079-0470</b>	1 Each
		0.25	<b>26079-1420</b>	1 Each
		0.5	<b>26079-2230</b>	1 Each
		0.25	<b>26079-1540</b>	1 Each
0.32	30	0.1	<b>26079-0480</b>	1 Each
		0.25	<b>26079-1430</b>	1 Each
		0.5	<b>26079-2240</b>	1 Each
		1.0	<b>26079-2970</b>	1 Each

### Applications

- Pesticides
- PCB congeners
- PAHs
- Aroclor mixes

### Similar to:

- Rxi-XLB
- DB-XLB
- VF-Xms

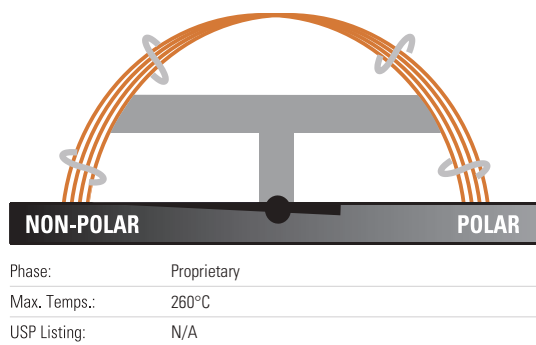
### Semi-Volatile Drinking Water Application Kit

Description	Cat. No.	Quantity
Semi-Volatile Drinking Water Application Kit	<b>60181-736</b>	1 Each
Containing the following:		
TraceGOLD TG-XLBMS GC Column 30m x 0.25mm x 0.25µm	<b>26079-1420</b>	1 Each
BTO Septa 17mm Diameter	<b>31303211</b>	50 Pack
S/SL Injector – Split/Splitless Liner, 5mm ID x 8mm OD x 105mm Length	<b>45350033</b>	5 Pack
S/SL Injector – Silver Seals	<b>29033629</b>	10 Pack
S/SL Injector – Graphite Liner Seals	<b>29033406</b>	10 Pack
S/SL Injector – Graphite Ferrules for 0.25mm ID Column	<b>29053488</b>	10 Pack
MS Interface – Graphite/Vespel Ferrules for 0.25mm ID Column	<b>29033496</b>	10 Pack
2mL Screw Top Vials, Amber Glass	<b>60180-567</b>	100 Pack
Blue Caps With PTFE/Red Rubber Seals	<b>60180-569</b>	100 Pack
5µL Fixed Needle Syringe, 50mm Length, 26 Gauge, Cone Needle	<b>36500505</b>	1 Each

## TraceGOLD TG-VRX GC Columns

Application specific column for volatile organic pollutants

- Highly stable polymer phase
- Low bleed for excellent signal-to-noise ratio, sensitivity and mass spectral integrity
- Excellent resolution for analysis of volatile compounds
- Fast analysis times for volatile compounds



### TraceGOLD TG-VRX GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	1.0	<b>26081-4950</b>	1 Each
	40	1.0	<b>26081-4960</b>	1 Each
0.25	30	1.4	<b>26081-3320</b>	1 Each
	60	1.4	<b>26081-3330</b>	1 Each
0.32	30	1.8	<b>26081-3390</b>	1 Each
	60	1.8	<b>26081-3410</b>	1 Each

### Applications:

- Volatile organic pollutants
- US EPA Method 8021 compounds

### Similar to:

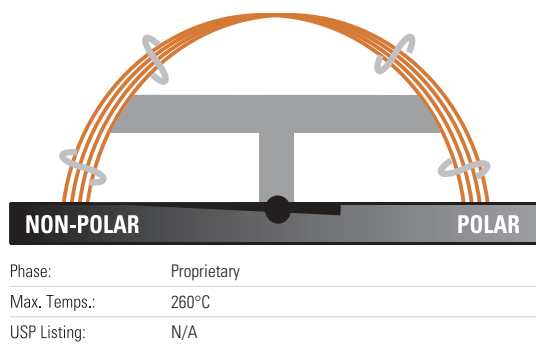
- Rtx-VRX
- DB-VRX



## TraceGOLD TG-VMS GC Columns

Application specific column for volatile organic pollutants

- Highly stable polymer phase
- Low bleed for excellent signal-to-noise ratio, sensitivity and mass spectral integrity
- Excellent resolution for analysis of volatile compounds
- Fast analysis times for volatile compounds



### TraceGOLD TG-VMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	1.0	<b>26080-4950</b>	1 Each
	40	1.0	<b>26080-4960</b>	1 Each
0.25	30	1.4	<b>26080-3320</b>	1 Each
	60	1.4	<b>26080-3330</b>	1 Each
0.32	30	1.8	<b>26080-3390</b>	1 Each
	60	1.8	<b>26080-3410</b>	1 Each

### Applications:

- Volatile organic pollutants
- US EPA Method 8260B compounds

### Similar to:

- Rtx-VMS

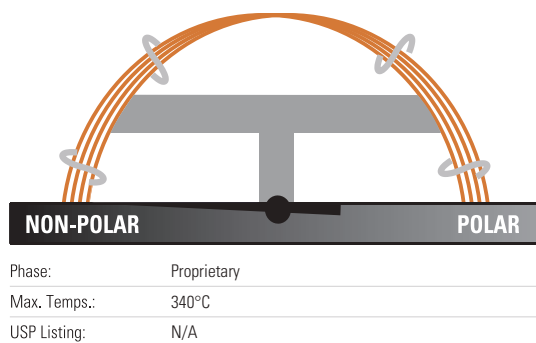
### Volatile Organic Compound (VOC) Application Kit

Description	Cat. No.	Quantity
Volatile Organic Compound (VOC) Application Kit	<b>60181-734</b>	1 Each
Containing the following:		
TraceGOLD TG-VMS GC Column 20m x 0.18mm x 1.00µm	<b>26080-4950</b>	1 Each
S/SL Injector – BTO Septa 9mm Diameter	<b>31303240</b>	50 Pack
S/SL Injector – Silver Seals	<b>29033629</b>	10 Pack
S/SL Injector – Graphite Liner Seals	<b>29033406</b>	10 Pack
S/SL Injector – Graphite Ferrules for 0.25mm ID Column	<b>29053488</b>	10 Pack
MS Interface – Graphite/Vespel Ferrules for 0.25mm ID Column	<b>29033496</b>	10 Pack
2mL Screw Top Vials, Amber Glass	<b>60180-567</b>	100 Pack
Blue Caps with PTFE/Red Rubber Seals	<b>60180-569</b>	100 Pack
40mL VOA Sample Vials with Caps and Seals	<b>60180-573</b>	72 Pack

## TraceGOLD TG-OCP I / TG-OCP II GC Columns

Application-specific columns for organochlorine pesticides and herbicides

- Low bleed for excellent signal-to-noise ratio, sensitivity and mass spectral integrity
- Fast analysis time giving full separation of chlorinated pesticides
- Ideal for US EPA methods 8081, 608 and CLP



### TraceGOLD TG-OCP I GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	<b>26078-0200</b>	1 Each
0.25	15	0.25	<b>26078-1300</b>	1 Each
	30	0.25	<b>26078-1420</b>	1 Each
	60	0.25	<b>26078-1540</b>	1 Each
0.53	30	0.32	<b>26078-5760</b>	1 Each
		0.5	<b>26078-2240</b>	1 Each

### Applications:

- Organochlorine pesticides
- Herbicides

### Similar to:

- Rtx-CLPesticides/  
Rtx-CLPesticides2

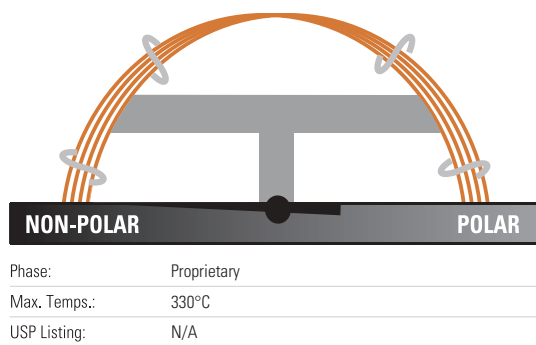
### TraceGOLD TG-OCP II GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	<b>26077-0200</b>	1 Each
	20	0.1	<b>26077-1450</b>	1 Each
0.18	10	0.14	<b>26077-5700</b>	1 Each
	20	0.14	<b>26077-5690</b>	1 Each
0.25	15	0.2	<b>26077-5730</b>	1 Each
	30	0.2	<b>26077-5720</b>	1 Each
	60	0.2	<b>26077-5710</b>	1 Each
0.32	15	0.25	<b>26077-1310</b>	1 Each
		0.25	<b>26077-1430</b>	1 Each
		0.5	<b>26077-2240</b>	1 Each
0.53	15	0.42	<b>26077-5750</b>	1 Each
	30	0.42	<b>26077-5740</b>	1 Each

# TraceGOLD TG-OPP I / TG-OPP II GC Columns

Application-specific columns for organophosphorus pesticides

- Low bleed for excellent signal-to-noise ratio, sensitivity and mass spectral integrity
- Fast analysis time giving full separation of organophosphorus pesticides
- Ideal for US EPA methods 8141A



## TraceGOLD TG-OPP I GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	<b>26076-1420</b>	1 Each
0.32	30	0.5	<b>26076-2240</b>	1 Each
0.53	30	0.83	<b>26076-0690</b>	1 Each

## TraceGOLD TG-OPP II GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	<b>26075-1420</b>	1 Each
0.32	30	0.32	<b>26075-5760</b>	1 Each
0.53	30	0.5	<b>26075-2250</b>	1 Each

### Applications:

- Organophosphorus pesticides

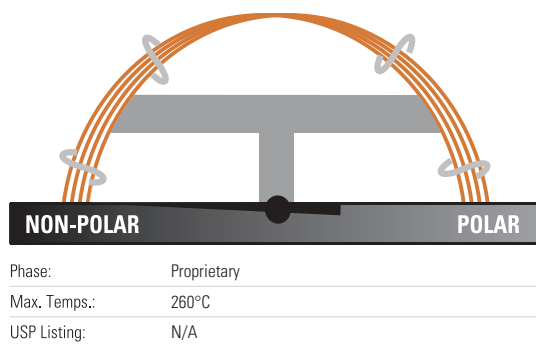
### Similar to:

- Rtx-OPPesticides/  
Rtx-OPPesticides2

## TraceGOLD TG-ALC Plus I / TG-ALC Plus II GC Columns

Application-specific columns for blood alcohol analysis

- Low bleed for excellent signal-to-noise ratio, sensitivity and mass spectral integrity
- Fast analysis time giving full separation of blood alcohols



### TraceGOLD TG-ALC Plus I GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.32	30	1.8	<b>26063-3390</b>	1 Each
0.53	30	3.0	<b>26063-3960</b>	1 Each

### TraceGOLD TG-ALC Plus II GC Columns

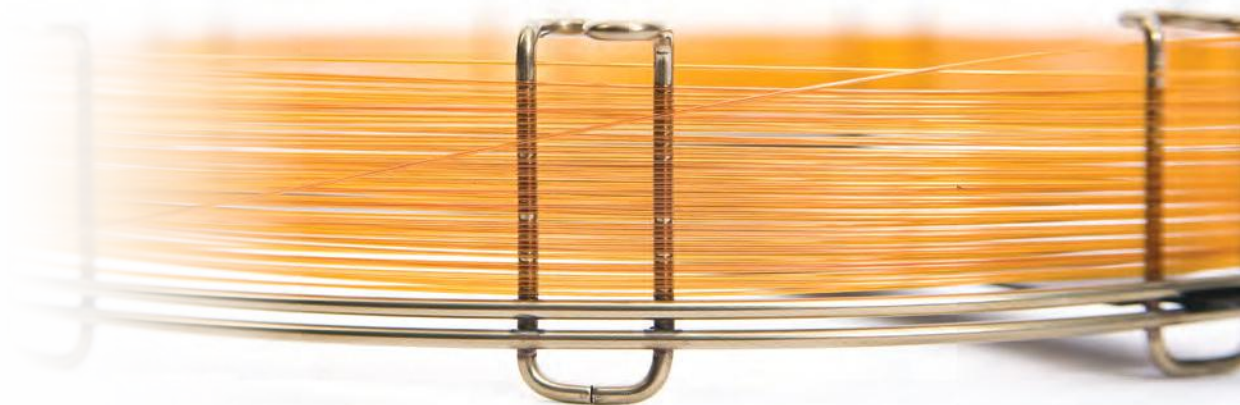
ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.32	30	0.5	<b>26063-2240</b>	1 Each
0.53	30	1.0	<b>26063-2980</b>	1 Each

### Applications:

- Blood alcohol analysis
- Abused inhalent anesthetics
- $\gamma$ -hydroxybutyrate (GHB)
- $\gamma$ -butyrolactone (GBL)
- Glycols
- Common industrial solvents

### Similar to:

- Rtx BAC Plus 1 / Rtx BAC Plus 2

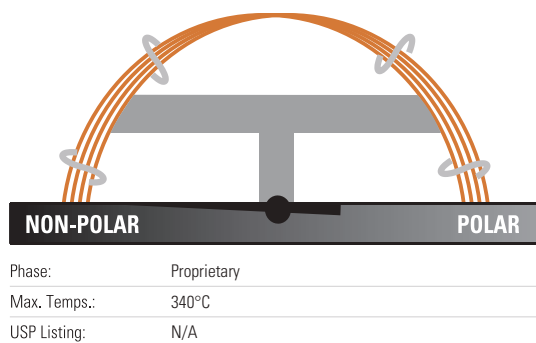




## TraceGOLD TG-Dioxin GC Columns

Excellent separation of toxic dioxin and furan congeners

- Isomer specificity for 2,3,7,8-TCDD and 2,3,7,8-TCDF achieved with a single GC column
- High thermal stability – maximum temperatures up to 340°C
- Unique selectivity for toxic dioxin and furan congeners allows use as a confirmation GC column



### TraceGOLD TG-Dioxin GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	40	0.18	<b>26066-4800</b>	1 Each
0.25	60	0.25	<b>26066-1540</b>	1 Each

### Persistent Organic Pollutants (POPs) Confirmation Kit

Description	Cat. No.	Quantity
Persistent Organic Pollutants (POPs) Confirmation Kit	<b>TS-MKITG503</b>	1 Each
Containing the following:		
TraceGOLD TG-Dioxin GC Column 60m x 0.25mm x 0.25µm	<b>26066-1540</b>	1 Each
S/SL Injector – BTO Septa 11mm diameter	<b>31303233</b>	50 Pack
S/SL Injector – Split Straight Liner 4 x 6.3 x 78.5mm, Quartz Wool	<b>453A2265</b>	5 Pack
S/SL Injector – Splitless Liner with Single Taper 4 x 6.3 x 78.5mm, Quartz Wool	<b>453A1925</b>	5 Pack
Gold Inlet Base Seals, Single Column Installation	<b>290GA081</b>	10 Pack
Graphite Liner Sealing Rings	<b>290GA243</b>	10 Pack
Graphite Ferrules for 0.1-0.32mm Column	<b>290GA139</b>	10 Pack
Graphite/Vespel Ferrules for 0.1-0.25mm Column	<b>290VA191</b>	10 Pack
1.1mL Screw Top Tapered Vial, Clear Gold Grade Glass	<b>1.1-STVG</b>	500 Pack
8mm Screw Caps with Pre-Fitted Silicone/PTFE Septa	<b>8-SC-ST15</b>	500 Pack
10µL Fixed Needle Syringe for TriPlus RSH, 57mm Length, 26s Gauge	<b>365D0291</b>	1 Each

#### Applications:

- Dioxins
- Furans

#### Similar to:

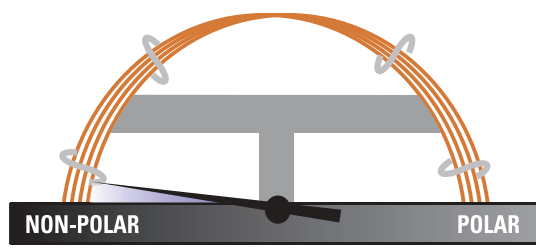
- Rtx-Dioxin2
- DB-Dioxin

# TRACE GC Columns

## TRACE TR-1 GC Columns

Designed for method development

- Non-polar phase, 100% dimethyl polysiloxane
- High operating temperature



Phase:	100% Dimethyl Polysiloxane
Max. Temps.:	340°C/360°C
USP Listing:	G1, G2, G38

### TRACE TR-1 GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>260A130P</b>	1 Each
	30	0.1	<b>260A047P</b>	1 Each
		0.25	<b>260A142P</b>	1 Each
	60	0.25	<b>260A154P</b>	1 Each
0.32	15	0.25	<b>260A131P</b>	1 Each
	30	0.25	<b>260A143P</b>	1 Each

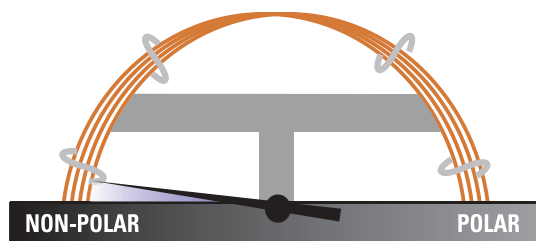
### Applications:

- Chlorinated and nitroaromatic compounds
- Environmental analyses

## TRACE TR-1MS GC Columns

Extremely low-bleed non-polar columns suitable for GC-MS applications

- Non-polar phase, 100% dimethyl polysiloxane
- High operating temperature
- Inert phase suited for environmental analyses



Phase:	100% Dimethyl Polysiloxane
Max. Temps.:	340°C/360°C
USP Listing:	G1, G2, G38

### TRACE TR-1MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.1	<b>260B047P</b>	1 Each
		0.25	<b>260B142P</b>	1 Each
	60	0.25	<b>260B154P</b>	1 Each
0.32	30	0.25	<b>260B143P</b>	1 Each
	60	0.25	<b>260B155P</b>	1 Each
		1.0	<b>260B309P</b>	1 Each

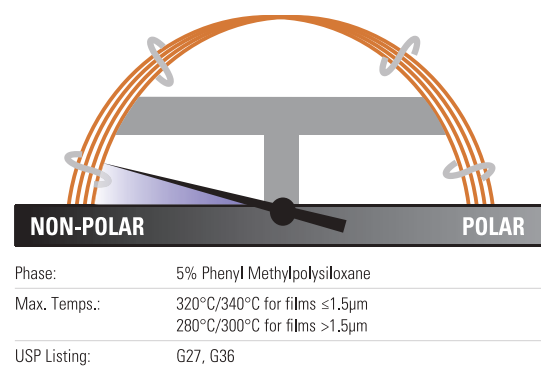
### Applications:

- Chlorinated and nitroaromatic compounds
- GC-MS environmental analyses

## TRACE TR-5 GC Columns

Excellent starting columns for method development, capable of performing most required separations

- Non-polar phase, 5% phenyl methyl polysiloxane
- High operating temperature and extremely low bleed
- Widely used in a variety of applications



### TRACE TR-5 GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>260E130P</b>	1 Each
	30	0.25	<b>260E142P</b>	1 Each
		0.5	<b>260E223P</b>	1 Each
	60	0.25	<b>260E154P</b>	1 Each
0.32	7	0.25	<b>260E113P</b>	1 Each
	15	0.25	<b>260E131P</b>	1 Each
	30	0.25	<b>260E143P</b>	1 Each
		0.5	<b>260E224P</b>	1 Each
		1.0	<b>260E297P</b>	1 Each
	60	0.25	<b>260E155P</b>	1 Each
	100	0.5	<b>260E242P</b>	1 Each
0.53	30	0.5	<b>260E225P</b>	1 Each
		1.0	<b>260E298P</b>	1 Each
		1.5	<b>260E336P</b>	1 Each
		5.0	<b>260E470P</b>	1 Each

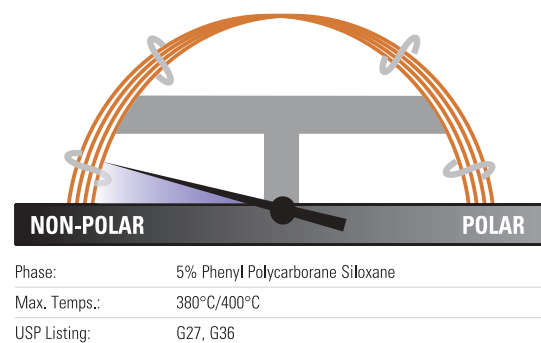
#### Applications:

- Alcohols
- Free fatty acids
- Aromatics
- Flavors
- Low polarity pesticides

## TRACE TR-5HT GC Columns

Feature upper temperature limits as high as 400°C

- Non-polar phase, 5% phenyl polycarborane siloxane
- Allow the elution of higher-boiling hydrocarbons up to C100
- Low bleed even at elevated temperatures



### TRACE TR-5HT GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.1	<b>260H035P</b>	1 Each
	30	0.1	<b>260H047P</b>	1 Each
		0.25	<b>260H142P</b>	1 Each
0.32	12	0.1	<b>260H030P</b>	1 Each

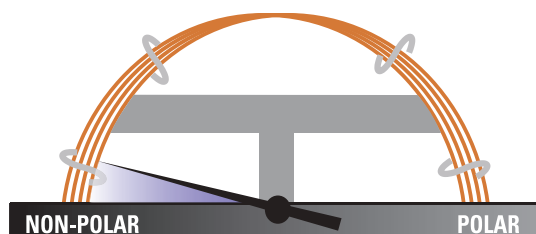
#### Applications:

- Hydrocarbons
- Solvents
- Pesticides
- Herbicides
- Phenols
- Amines

## TRACE TR-5MS GC Columns

Features a popular GC-MS phase for many applications

- Non-polar phase, 5% phenyl polysilphenylene-siloxane
- Low bleed and high stability
- High signal-to-noise ratio for increased sensitivity
- High robustness to oxygen and water contamination



Phase:	5% Phenyl Polysilphenylene-siloxane
Max. Temps.:	360°C/370°C for films ≤1.5µm 350°C/360°C for films >1.5µm
USP Listing:	G27, G36

### TRACE TR-5MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.1	<b>260F020P</b>	1 Each
0.15	25	0.25	<b>260F134P</b>	1 Each
0.18	20	0.18	<b>260F578P</b>	1 Each
0.25	15	0.1	<b>260F035P</b>	1 Each
		0.25	<b>260F130P</b>	1 Each
		0.1	<b>260F047P</b>	1 Each
		0.25	<b>260F142P</b>	1 Each
		0.25	<b>260F142J</b>	1 Each
		0.5	<b>260F223P</b>	1 Each
		1.0	<b>260F296P</b>	1 Each
0.32	60	0.25	<b>260F154P</b>	1 Each
		1.0	<b>260F308P</b>	1 Each
		1.0	<b>260F285P</b>	1 Each
0.32	15	0.25	<b>260F143P</b>	1 Each
		0.5	<b>260F224P</b>	1 Each
		1.0	<b>260F297P</b>	1 Each
		1.0	<b>260F225P</b>	1 Each
0.53	30	0.5	<b>260F225P</b>	1 Each
		1.0	<b>260F298P</b>	1 Each
		1.5	<b>260F336P</b>	1 Each
		3.0	<b>260F396P</b>	1 Each

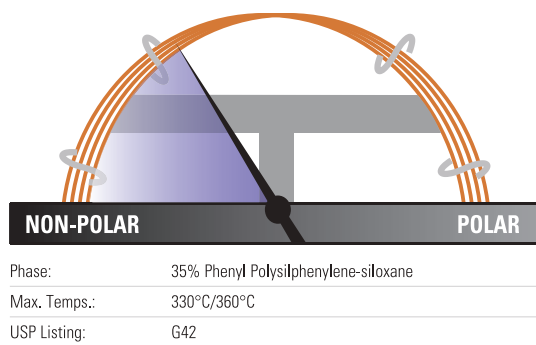
### Applications:

- Hydrocarbons
- Solvents
- Pesticides
- Herbicides
- Phenols
- Amines

## TRACE TR-35MS GC Columns

Mid-polarity columns excellent for many applications

- Mid-polarity phase, 35% phenyl polysilphenylene-siloxane
- Exceptionally low surface activity
- Low bleed even at elevated temperatures



### TRACE TR-35MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>260C130P</b>	1 Each
	30	0.25	<b>260C142P</b>	1 Each
	60	0.25	<b>260C154P</b>	1 Each
0.32	30	0.25	<b>260C143P</b>	1 Each
0.53	15	1.0	<b>260C286P</b>	1 Each
	30	1.0	<b>260C298P</b>	1 Each

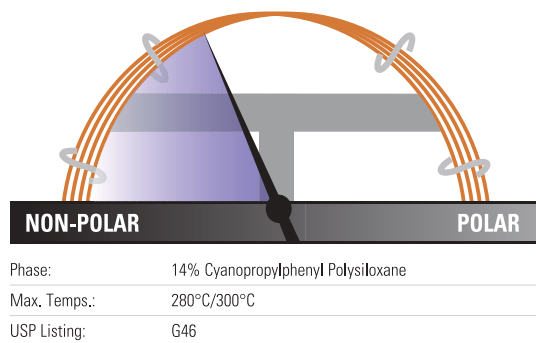
### Applications:

- Pesticides
- Herbicides
- Drugs of abuse
- PAHs
- Pharmaceuticals

## TRACE TR-1701 GC Columns

Mid-polarity column with alternative selectivity

- Mid-polarity phase, 14% cyanopropylphenyl polysiloxane
- Low bleed even at a high operating temperature
- Excellent starting point for method development
- Suitable for a wide variety of applications



### TRACE TR-1701 GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	<b>260Q142P</b>	1 Each
	60	0.25	<b>260Q154P</b>	1 Each
0.32	15	0.25	<b>260Q131P</b>	1 Each
	30	0.25	<b>260Q143P</b>	1 Each
	60	1.0	<b>260Q309P</b>	1 Each
		0.25	<b>260Q155P</b>	1 Each
0.53	30	1.0	<b>260Q298P</b>	1 Each

### Applications:

- Pesticides
- PCBs
- PAHs
- Organic acids
- Drugs
- Steroids
- EPA 608, 8081

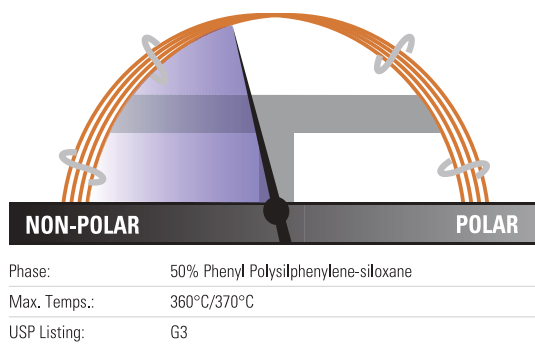
## TRACE TR-50MS GC Columns

Mid-polarity columns well-suited to GC-MS applications

- Mid-polarity phase, 50% phenyl polysilphenylene-siloxane
- Low bleed decreases MS contamination
- Particularly useful for applications requiring a higher temperature and more polarity than a 5% phenyl column
- Column inertness results in minimal peak tailing and decreased breakdown of sensitive samples

### TRACE TR-50MS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>260R130P</b>	1 Each
	30	0.15	<b>260R050P</b>	1 Each
		0.25	<b>260R142P</b>	1 Each
0.32	30	0.25	<b>260R143P</b>	1 Each



### Applications:

- Herbicides
- Drugs of abuse
- EPA 604, 608, 8060, 8081
- Pharmaceuticals

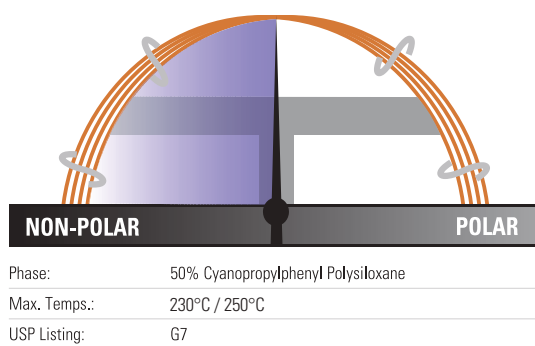
## TRACE TR-225 GC Columns

Reliable and reproducible performance

- Mid-polarity phase, 50% cyanopropylphenyl polysiloxane
- Low bleed even at elevated temperatures
- Outstanding robustness for difficult separations
- Manufactured to minimize risk of damage from contaminated carrier gas

### TRACE TR-225 GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	<b>260Y142P</b>	1 Each
	60	0.25	<b>260Y154P</b>	1 Each
0.32	25	0.25	<b>260Y137P</b>	1 Each



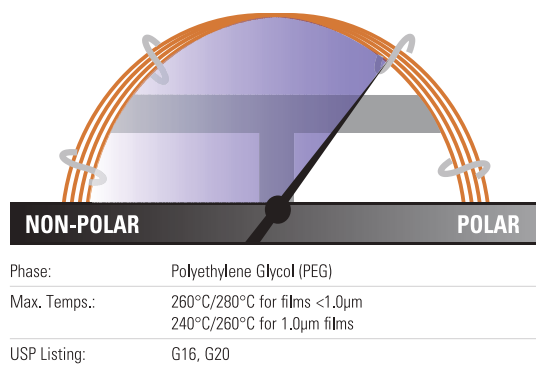
### Applications:

- Fatty Acid Methyl Esters (FAMES)
- Carbohydrates
- Neutral sterols

## TRACE TR-Wax GC Columns

General purpose, high-polarity columns

- Polar phase, polyethylene glycol
- Highly crosslinked and fully deactivated
- Solvent washable



### TRACE TR-Wax GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	<b>260W142P</b>	1 Each
		0.5	<b>260W223P</b>	1 Each
		1.0	<b>260W296P</b>	1 Each
0.32	60	0.25	<b>260W154P</b>	1 Each
		0.25	<b>260W131P</b>	1 Each
	30	0.25	<b>260W143P</b>	1 Each
		0.5	<b>260W224P</b>	1 Each
		1.0	<b>260W297P</b>	1 Each
		0.25	<b>260W155P</b>	1 Each
0.53	60	1.0	<b>260W309P</b>	1 Each
		1.0	<b>260W286P</b>	1 Each
	15	0.5	<b>260W225P</b>	1 Each
		1.0	<b>260W298P</b>	1 Each
		1.0	<b>260W298P</b>	1 Each
		1.0	<b>260W310P</b>	1 Each

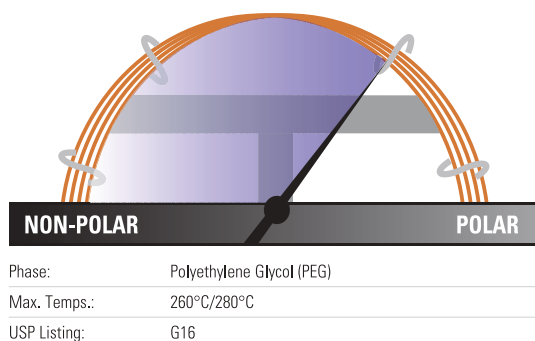
### Applications:

- Esters
- Alcohols
- Ketones
- Glycols
- Aromatic isomers

## TRACE TR-WaxMS GC Columns

Feature a high-polarity phase designed for mass spectrometry detectors

- Polar phase, polyethylene glycol
- Proprietary bonding method expands operating temperatures
- Extremely low bleed improves sensitivity and library matches
- High stability with oxygen and water



### TRACE TR-WaxMS GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	30	0.25	<b>260X142P</b>	1 Each
		0.5	<b>260X223P</b>	1 Each
		1.0	<b>260X296P</b>	1 Each
0.32	60	0.25	<b>260X154P</b>	1 Each
		0.25	<b>260X143P</b>	1 Each
	30	0.5	<b>260X224P</b>	1 Each
0.25		<b>260X155P</b>	1 Each	

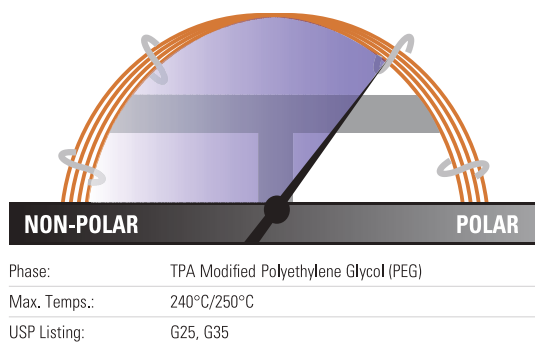
### Applications:

- Aromatic hydrocarbons
- Food additives
- Essential oils
- Alcohols
- Esters
- Aldehydes
- Ketones

## TRACE TR-FFAP GC Columns

High-polarity phase optimized for FFAP analysis

- Polar phase, TPA modified polyethylene glycol
- Bonded FFAP phase
- Quality tested for acidic compound analysis



### TRACE TR-FFAP GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.25	15	0.25	<b>260N130P</b>	1 Each
	30	0.25	<b>260N142P</b>	1 Each
	60	0.25	<b>260N154P</b>	1 Each
0.32	30	0.25	<b>260N143P</b>	1 Each
	50	0.5	<b>260N230P</b>	1 Each
0.53	15	0.5	<b>260N213P</b>	1 Each
	30	0.5	<b>260N225P</b>	1 Each
		1.0	<b>260N298P</b>	1 Each

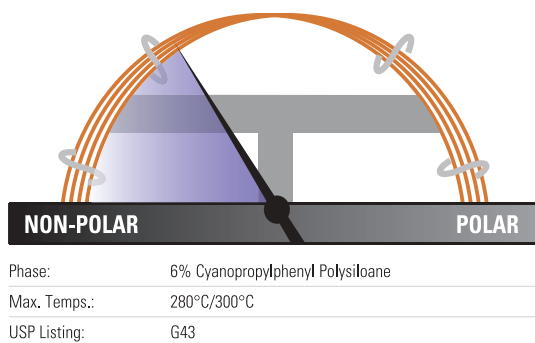
### Applications:

- FFAP analysis
- Acidic compound analysis

## TRACE TR-V1 GC Columns

Mid-polarity, thick-film columns

- Mid-polarity phase, 6% cyanopropylphenyl polysiloxane
- Thick films for the analysis of volatile analytes
- Low bleed suitable for MS detection



### TRACE TR-V1 GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.18	20	1.0	<b>260V495P</b>	1 Each
0.25	30	1.4	<b>260V332P</b>	1 Each
	60	1.4	<b>260V333P</b>	1 Each
0.32	30	1.8	<b>260V339P</b>	1 Each
	60	1.8	<b>260V341P</b>	1 Each
0.53	30	3.0	<b>260V396P</b>	1 Each

### Applications:

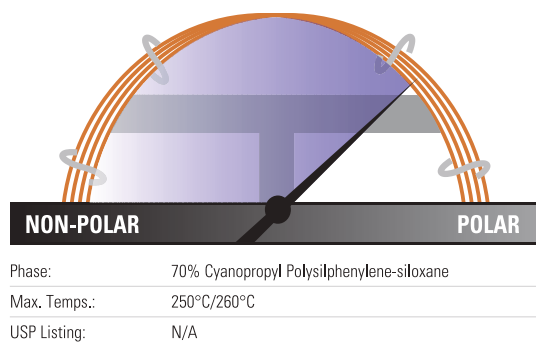
- Volatile organics
- Alcohols
- EPA 502.2, 608 and 624



## TRACE TR-FAME GC Columns

High-polarity phase optimized for FAME analysis

- Polar phase, 70% cyanopropyl polysilphenylene-siloxane
- High operating temperature compared to competitor columns
- Low bleed for mass spectrometry use



### TRACE TR-FAME GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.10	10	0.2	<b>260M096P</b>	1 Each
0.22	25	0.25	<b>260M135P</b>	1 Each
	30	0.25	<b>260M141P</b>	1 Each
	50	0.25	<b>260M147P</b>	1 Each
	60	0.25	<b>260M153P</b>	1 Each
0.25	30	0.25	<b>260M142P</b>	1 Each
	60	0.25	<b>260M154P</b>	1 Each
	120	0.25	<b>260M166L</b>	1 Each
0.32	25	0.25	<b>260M137P</b>	1 Each
	30	0.25	<b>260M143P</b>	1 Each
	60	0.25	<b>260M155P</b>	1 Each

### Applications:

- Fatty Acid Methyl Esters (FAMEs)
- FAMEs Cis/Trans Isomers

## TRACE GC Columns for EPA Methods

Low bleed and temperature-stable performance tailored to specific EPA methodologies

- TRACE TR-524 and TRACE TR-525 Columns: US EPA Drinking Water Test Methods 524 or 525
- TRACE TR-527 Columns: US EPA Drinking Water Test Method 527, features the robust, low-bleed performance required for analysis of pesticides and flame retardants
- TRACE TR-8270 Columns: US EPA Solid Waste Test Method 8270
- TRACE TR-8095 Columns: US EPA Method 8095 for Explosives Testing featuring high max temperature and low surface activity

### TRACE GC Columns for EPA Methods

Phase	ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
TR-524	0.18	20	1.0	<b>26RV495P</b>	1 Each
TR-525	0.25	30	0.25	<b>26RX142P</b>	1 Each
TR-527	0.25	30	0.25	<b>26RF142P</b>	1 Each
TR-8095	0.32	12	0.25	<b>260P123P</b>	1 Each
TR-8270	0.25	30	0.5	<b>26RF223P</b>	1 Each
TR-8270	0.25	30	1.0	<b>26RF296P</b>	1 Each

### Applications:

- Volatile Organic Compounds (VOCs)
- Pesticides
- Flame retardants
- Explosives

## TRACE GC Columns for Pesticides

Specifically designed and tested for analysis of pesticides

- Low bleed decreases MS contamination
- Particularly useful for applications requiring a higher temperature
- Column inertness results in minimal peak tailing and decreased breakdown of sensitive samples

### Applications:

- Organophosphate pesticides
- Organochlorine pesticides
- Pyrethroid pesticides
- Herbicides

### TRACE GC Columns for Pesticides

Phase	ID (mm)	Length (m)	Film Thickness (µm)	Guard	Cat. No.	Quantity
TR-Pesticide	0.25	30	0.25	5m guard column attached	<b>26RF142F</b>	1 Each
TR-Pesticide II	0.25	30	0.25	5m guard column attached	<b>26RD142F</b>	1 Each
TR-Pesticide III	0.25	30	0.25	5m guard column attached	<b>26RC142F</b>	1 Each
TR-Pesticide IV	0.25	30	0.25	–	<b>26RC142P</b>	1 Each

## TRACE GC Columns for Dioxin and PCB Analysis

Designed to meet the requirements of high resolution GC-MS methods

- TRACE TR-Dioxin 5MS Columns; Specifically designed for Dioxin and Furan testing
- Wide coverage of the 17 congeners with the highest toxicological significance
- TRACE TR-PCB 8MS Columns; meets the requirements for HR GC-MS analysis of PCBs
- Low bleed

### TRACE GC Columns for Dioxin and PCB Analysis

Phase	ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
TR-PCB 8MS	0.25	50	0.25	<b>26AJ148P</b>	1 Each
TR-Dioxin 5MS	0.25	60	0.25	<b>26AF154P</b>	1 Each
TR-Dioxin 5MS	0.25	30	0.1	<b>26AF047P</b>	1 Each
TR-Dioxin 5MS	0.25	60	0.1	<b>26AF059P</b>	1 Each

#### Applications:

- Dioxins (PCDDs)
- Furans (PCDFs)
- PCB congeners

## TRACE GC Columns for Biodiesel Analysis

Designed for use in carbon neutral fuels development applications

- GC columns designed for specific EN methods and ASTM methods
- Specific columns for the determination of methanol, FAMES or glycerides

#### Applications:

- Biodiesel
- ASTM D-6584
- EN14214

### TRACE GC Columns for Biodiesel Analysis

Phase	Method	ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
TR-BioDiesel (M)	EN 14110	0.32	30	3.0	<b>26AA395P</b>	1 Each
TR-BioDiesel (G)	EN 14105	0.32	10	0.1	<b>26AF024P</b>	1 Each
TR-BioDiesel (F)	EN 14103	0.25	30	0.25	<b>26AX142P</b>	1 Each
TR-BioDiesel (G) ASTM	ASTM D-6584	0.32	10	0.1	<b>26RF024P</b>	1 Each

## TRACE GC Columns for Drugs of Abuse

Specifically designed for the analysis of common drugs of abuse

- TRACE TR-DoA 5MS Columns; widely used for the analysis and determination of a range of toxicological target compounds including amphetamines, codeine and morphine
- TRACE TR-DoA 35MS Columns; the recommended column for use in drug testing labs for the confirmation of THC

### TRACE GC Columns for Drugs of Abuse

Phase	ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
TR-DoA35	0.20	15	0.33	<b>26AC497P</b>	1 Each
TR-DoA5	0.25	15	0.25	<b>26AF130P</b>	1 Each

#### Applications:

- Amphetamines, codeine and morphine

## UltraFast GC Columns

The huge demand of samples to be analyzed every day by labs in industries such as environmental and petrochemical requires an increased speed of analysis

A significant gain in analysis speed compared to conventional GC procedures is obtained through UltraFast Gas Chromatography. UltraFast GC utilizes short (2-10m) narrow bore capillaries and temperature programming conditions usually faster than 2°C/s. This leads to peak widths in the 50-200ms range. The analysis times are in the range of 1 minute or even less.

### Benefits of UltraFast GC Columns

- Dramatically shorter analysis times – typically a minute or less
- Ideal for applications in petrochemical and environmental markets
- Long column lifetimes

### Application – UltraFast Analysis of Pure Petroleum Products through Nanovolumes Injection

The analyses were performed in the UltraFast GC mode using a TRACE GC Ultra System equipped with a Split/Splitless injector (SSL) and a Digital Pressure and Flow Controller, as well as a FAST FID detector. The GC System was also equipped with an UltraFast Module (UFM).

Split injections were performed with a AS3000 Autosampler using a 0.5µL plunger-in-needle syringe p/n 36504045. A minimum penetration depth in the injector (cold needle mode) was set, and 0.3µL of air was automatically withdrawn after the sample to ensure that the part of the needle inserted into the injector was empty. A 3mm ID upper-tapered empty liner with an 8mm long and 1mm wide restriction at the top was installed. The SSL injector was set to 225°C and the FID to 320°C.

#### UFC-1 10m x 0.32mm x 3µm

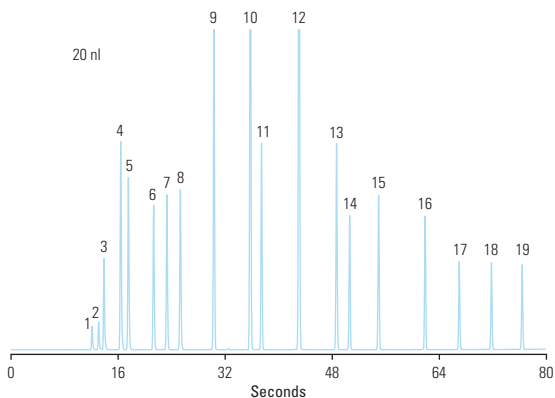
Temperature: 40°C (6 sec hold) to 300°C  
(6 sec hold) at 180°C/min

Detector Type: FID

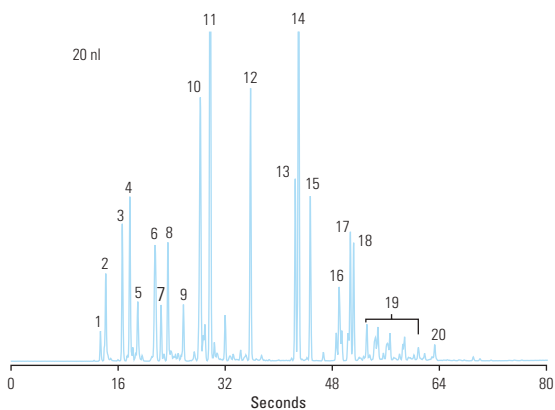
Carrier Gas: Helium

Flow Rate: 0.5mL/min

Injection Mode: Split/Splitless



- |                     |                    |
|---------------------|--------------------|
| 1. propane          | 11. octane         |
| 2. methyl-propane   | 12. p-xylene       |
| 3. butane           | 13. propyl-benzene |
| 4. methyl-butane    | 14. n-decane       |
| 5. pentane          | 15. butyl-benzene  |
| 6. methyl-pentane   | 16. n-dodecane     |
| 7. hexane           | 17. n-tridecane    |
| 8. dimethyl-pentane | 18. n-tetradecane  |
| 9. heptane          | 19. n-pentadecane  |
| 10. toluene         |                    |



- |                      |                                     |
|----------------------|-------------------------------------|
| 1. methyl-propane    | 12. toluene                         |
| 2. butane            | 13. ethyl-benzene                   |
| 3. 2-methyl-butane   | 14. p-xylene                        |
| 4. pentane           | 15. m-xylene                        |
| 5. ter-butyl alcohol | 16. propyl-benzene                  |
| 6. methyl-pentane    | 17. tetramethyl-octane              |
| 7. 3-methyl-pentane  | 18. 1,2,4-trimethyl-benzene         |
| 8. hexane            | 19. tri/tetramethyl-benzene isomers |
| 9. dimethyl-pentane  | 20. naphthalene                     |
| 10. cyclohexane      |                                     |
| 11. dimethyl-hexane  |                                     |

## UltraFast GC Columns

Short, narrow-bore columns for use with the Thermo Scientific TRACE GC UltraFast instrument

- Dramatically shorter analysis times
- Increase sample throughput by a factor of 20
- Lengthen column lifetimes

### Applications:

- Chemical
- Petrochemical
- Environmental
- Flavors and fragrances

### UltraFast GC Columns

Phase	ID (mm)	Length (m)	Film Thickness (µm)	Uses	Cat. No.	Quantity
UFC-1	0.10	5	0.1	General	<b>UFMC00001010401</b>	1 Each
		5	0.1	ASTM D-2887	<b>UFMC00001070401</b>	1 Each
	0.32	5	0.25	ISO 9377-2	<b>UFMC00001070404</b>	1 Each
		10	3.0	ASTM D-3710	<b>UFMC00002070414</b>	1 Each
UFC-5	0.10	2.5	0.4	General	<b>UFMC00100000000</b>	1 Each
		5	0.4	General	<b>UFMC00200000000</b>	1 Each
		5	0.1	General	<b>UFMC00300000000</b>	1 Each
		10	0.1	General	<b>UFMC00002010601</b>	1 Each
		10	0.4	General	<b>UFMC00502010006</b>	1 Each
UFC-1701	0.10	5	0.1	General	<b>UFMC00400000000</b>	1 Each
UFC-WAX	0.10	5	0.1	FAMES, Essential Oils	<b>UFMC00001010501</b>	1 Each
		5	0.2	General	<b>UFMC00001010503</b>	1 Each
UFC-264	0.10	10	0.5	Volatiles	<b>UFMC00002010207</b>	1 Each
UFC-BioDiesel	0.32	5	0.5	Biodiesel	<b>UFMC00001070600</b>	1 Each
UFC-M1	0.32	5	0.25	General	<b>UFMC00001070904</b>	1 Each
UFC-POR Q					<b>UFMC00002060614</b>	1 Each



# TracePLOT GC Columns

## TracePLOT TG-BOND Alumina GC Columns: Na<sub>2</sub>SO<sub>4</sub> and KCl Deactivation

Optimized for linear and quantitative analysis of polar unsaturated hydrocarbons

- Strong bonding to prevent particle generation suits these columns in valve-switching operations without damage to injection and detection systems from particle release
- Columns to which water has adsorbed may be regenerated to restore full efficiency and selectivity
- Each column has been tested to ensure proper film thickness (1,3-butadiene), selectivity (propadiene and methyl acetylene), resolution (trans-2-butene and 1-butene) and coating efficiency (1,3-butadiene)

### TracePLOT TG-BOND Alumina GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
<b>Na<sub>2</sub>SO<sub>4</sub> Deactivation</b>				
0.32	30	5	<b>26001-6020</b>	1 Each
	50	5	<b>26001-6050</b>	1 Each
0.53	30	10	<b>26001-6080</b>	1 Each
	50	10	<b>26001-6110</b>	1 Each
<b>KCl Deactivation</b>				
0.32	30	5	<b>26002-6020</b>	1 Each
	50	5	<b>26002-6050</b>	1 Each
0.53	30	10	<b>26002-6080</b>	1 Each
	50	10	<b>26002-6110</b>	1 Each

### Applications:

- C1-C5 hydrocarbons
- Unsaturated hydrocarbon isomers

## TracePLOT TG-BOND Msieve 5A GC Columns

Designed for separation of Ar/O<sub>2</sub> and other permanent gases

- Specially designed coating and deactivation procedures for chromatographic efficiency and the integrity of the coating porous layer
- Deactivation process yields a sharp peak for CO elution rather than the tailing commonly seen in other columns
- High retention of molecular sieve permits separation of permanent gases at temperatures above ambient
- Uniform particles remain adherent to the tubing even following continuous valve-cycling

### TracePLOT TG-BOND Msieve 5A GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.32	15	30	<b>26003-6010</b>	1 Each
	30	30	<b>26003-6040</b>	1 Each
0.53	15	50	<b>26003-6070</b>	1 Each
	30	50	<b>26003-6100</b>	1 Each
	50	50	<b>26003-1630</b>	1 Each

### Applications:

- Permanent gases
- Refinery or natural gases

## TracePLOT TG-BOND Q GC Columns

Non-polar columns for oxygenated compounds and solvents

- Non-polar 100% divinyl benzene phase
- Particles incorporated into the walls of the tubing for essentially no particle release

### TracePLOT TG-BOND Q GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.32	15	10	<b>26004-6000</b>	1 Each
	30	10	<b>26004-6030</b>	1 Each
0.53	15	20	<b>26004-6060</b>	1 Each
	30	20	<b>26004-6090</b>	1 Each

### Applications:

- C1 to C3 isomers and alkanes up to C12
- Separation of CO<sub>2</sub>, methane and O<sub>2</sub>/N<sub>2</sub>/CO
- Analysis of oxygenated compounds and solvents

## TracePLOT TG-BOND Q+ GC Columns

Intermediate polarity columns for baseline separation of ethane, ethylene and acetylene

- Intermediate polarity, porous divinyl benzene homopolymer
- Particles incorporated into the walls of the tubing for essentially no particle release

### TracePLOT TG-BOND Q+ GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.32	15	10	<b>26005-6000</b>	1 Each
	30	10	<b>26005-6030</b>	1 Each
0.53	15	20	<b>26005-6060</b>	1 Each
	30	20	<b>26005-6090</b>	1 Each

### Applications:

- Separation of ethane, ethylene and acetylene to baseline

## TracePLOT TG-BOND S GC Columns

Columns for analysis of non-polar and mid-polar compounds

- Mid-polarity, divinylbenzene 4-vinylpyridine solid phase
- Particles incorporated into the walls of the tubing for essentially no particle release

### TracePLOT TG-BOND S GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.32	15	10	<b>26006-6000</b>	1 Each
	30	10	<b>26006-6030</b>	1 Each
0.53	15	20	<b>26006-6060</b>	1 Each
	30	20	<b>26006-6090</b>	1 Each

### Applications:

- Non-polar and mid-polar compounds

## TracePLOT TG-BOND U GC Columns

Columns for analysis of polar compounds

- Polar, divinylbenzene ethylene glycol/dimethylacrylate phase
- Particles incorporated into the walls of the tubing for essentially no particle release

### TracePLOT TG-BOND U GC Columns

ID (mm)	Length (m)	Film Thickness (µm)	Cat. No.	Quantity
0.32	15	10	<b>26007-6000</b>	1 Each
	30	10	<b>26007-6030</b>	1 Each
0.53	15	20	<b>26007-6060</b>	1 Each
	30	20	<b>26007-6090</b>	1 Each

### Applications:

- Analysis of polar compounds

## TracePLOT Particle Traps for GC Instruments

Provides a safeguard from dislodged particles entering the detector

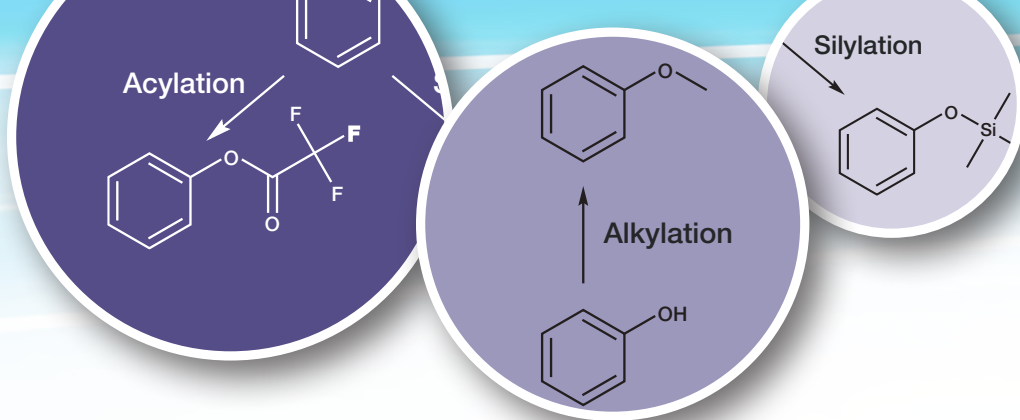
- Provides a safeguard from dislodged particles entering the detector

### TracePLOT Particle Traps for GC Instruments

Description	ID (mm)	Cat. No.	Quantity
PLOT Particle Trap 2.5m x 0.25mm	0.25	<b>60180-862</b>	1 Each
PLOT Particle Trap 2.5m x 0.32mm	0.32	<b>60180-860</b>	1 Each
PLOT Particle Trap 2.5m x 0.53mm	0.53	<b>60180-861</b>	1 Each







## GC Reagents

### Making the undetectable, detectable

Improve separation and detection for GC and GC-MS applications with our selection of derivatization reagents.

#### The Ideal Derivatization Procedure Will:

- Accomplish the desired modification.
- Proceed quantitatively, or at least reproducibly.
- Produce products that are readily distinguishable and separable from the starting materials.
- Proceed rapidly with simple and straightforward laboratory techniques that will be both selective and applicable to a number of similar compounds.
- Involve reagents and reactions that present no unusual hazards.

#### Why Derivatize:

- To make a compound that otherwise could not be analyzed by a particular method suitable for analysis.
- To improve the analytical efficiency of the compound.
- To improve the detectability of the compound.

The GC Reagents web page contains the latest news, applications and downloads for the GC Reagents range. Visit [www.thermoscientific.com/gcreagents](http://www.thermoscientific.com/gcreagents)



# GC Reagents

## Technical Resources



visit [www.thermoscientific.com/chromexpert](http://www.thermoscientific.com/chromexpert)  
to access the following information:

- Thermo Scientific Silylation Reagents Overview
- Thermo Scientific Acylation Reagents Overview
- Thermo Scientific Alkylation Reagents Overview
- Derivatization Reagents for Specific Functional Groups
- Derivatization Reagents for Drugs of Abuse
- Troubleshooting Reagents

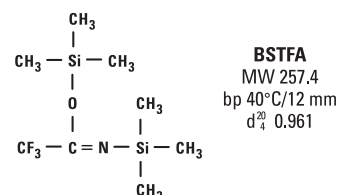


## Silylation Reagents

### BSTFA and BSTFA + TMCS

For excellent chromatographic separations and difficult-to-silylate compounds

- Increased volatility makes it possible to derivatize smaller molecules with which the TMS derivatives elute with the byproducts from BSA
- Excellent for derivatizing fatty acid amides, slightly hindered hydroxyls and other compounds
- Catalyzed formulation is stronger than BSTFA alone



#### BSTFA and BSTFA + TMCS

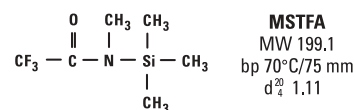
Description	Quantity	Cat. No.	Quantity
BSTFA	10 × 1mL ampules	<b>TS-38830</b>	1 Pack
	25g	<b>TS-38828</b>	1 Each
	100g	X <b>TS-38829</b>	1 Each
BSTFA + 1% TMCS	10 × 1mL ampules	<b>TS-38831</b>	1 Pack
	10g	<b>TS-38832</b>	1 Each
	25g	<b>TS-38833</b>	1 Each
	100g	X <b>TS-38834</b>	1 Each
BSTFA + 10% TMCS	10 × 1mL ampules	<b>TS-38840</b>	1 Pack

X in the ordering table indicates that hazardous shipping charges apply.

### MSTFA and MSTFA + 1% TMCS

Offers maximum volatility

- Trimethylsilyl donor strength comparable to BSA and BSTFA
- Reacts to replace labile hydrogens on a wide range of polar compounds with a Si(CH<sub>3</sub>)<sub>3</sub> group
- Used to prepare volatile and thermally stable derivatives for GC and GC-MS
- Addition of Thermo Scientific TMCS aids derivatization of amides, secondary amines and hindered hydroxyls not derivatized by MSTFA alone



#### MSTFA and MSTFA + 1% TMCS

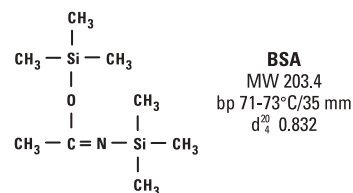
Description	Quantity	Cat. No.	Quantity
MSTFA	10 × 1mL ampules	<b>TS-48910</b>	1 Pack
	10g	<b>TS-48911</b>	1 Each
	25mL	<b>TS-48913</b>	1 Each
	100mL	X <b>TS-48914</b>	1 Each
MSTFA + 1% TMCS	10 × 1mL ampules	<b>TS-48915</b>	1 Pack

X in the ordering table indicates that hazardous shipping charges apply.

## BSA

The perfect reagent for rapid silylation reactions

- Highly reactive trimethylsilyl donor that reacts quantitatively to form volatile, stable TMS derivatives
- Reacts quickly and quantitatively under mild conditions with a variety of compounds
- Derivatizes alcohols, amines, amides, carboxylic acids, phenols, steroids, biogenic amines and alkaloids



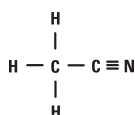
### BSA

Description	Quantity	Cat. No.	Quantity
BSA	10 x 1mL	<b>TS-38836</b>	1 Pack

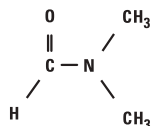
## Silylation Grade Solvents

Manufactured to meet your exacting silylation needs

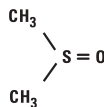
- Purified, dried and packaged under nitrogen in convenient 50mL Hypo-Vial Sample Storage Vials
- Supplied with elastomer septa, allowing immediate access to the sample without exposure to moisture and oxygen
- Use polar solvents (acetonitrile, dimethylformamide, dimethylsulfoxide, pyridine, tetrahydrofuran) to facilitate reactions; nonpolar organic solvents may be used, but they will not accelerate the rate of reaction



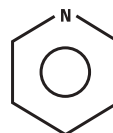
**Acetonitrile**  
 MW 41.05  
 bp 81.6°C



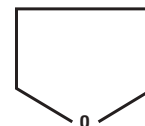
**Dimethylformamide**  
 MW 73.09  
 bp 153°C



**Dimethylsulfoxide**  
 MW 78.13  
 bp 189°C



**Pyridine**  
 MW 79.10  
 bp 115.2°C



**Tetrahydrofuran**  
 MW 72.10  
 bp 66°C

### Silylation Grade Solvents

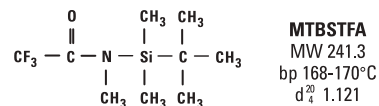
Description	Quantity	Cat. No.	Quantity
Acetonitrile	50mL	X <b>TS-20062</b>	1 Each
Dimethylformamide (DMF)	50mL	X <b>TS-20672</b>	1 Each
Dimethylsulfoxide (DMSO)	50mL	X <b>TS-20684</b>	1 Each
Pyridine	50mL	X <b>TS-27530</b>	1 Each
Tetrahydrofuran (THF)	50mL	X <b>TS-27860</b>	1 Each

X in the ordering table indicates that hazardous shipping charges apply.

## MTBSTFA and MTBSTFA + 1% TBDMCS

Offers stable TBDMS (tert-butyldimethylsilyl) derivatization

- Derivatizes hydroxyl, carboxyl, thiol and primary and secondary amines
- Typical yields are >96%
- Reaction byproducts are neutral and volatile
- Silylating potential increased by adding 1% TBDMCS



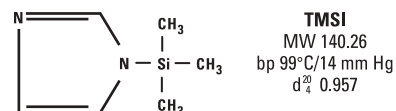
### MTBSTFA and MTBSTFA + 1% TBDMCS

Description	Quantity	Cat. No.	Quantity
MTBSTFA	5mL ampules	<b>TS-48920</b>	1 Each
MTBSTFA + 1% TBDMCS	10 × 1mL	<b>TS-48927</b>	1 Pack

## TMSI (*N*-Trimethylsilylimidazole)

The strongest silylator available for carbohydrates and steroids

- Reacts quickly and smoothly with hydroxyls and carboxylic acids, but not with amines
- Used in the derivatization of alcohols, phenols, organic acids, steroids, hormones, glycols, nucleotides and narcotics
- Excellent for C1 through C5 fatty acids in serum and urine



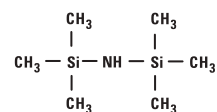
### TMSI

Description	Quantity	Cat. No.	Quantity
TMSI ( <i>N</i> -Trimethylsilylimidazole)	10 × 1mL ampules	<b>TS-88623</b>	1 Pack
	25g	<b>TS-88625</b>	1 Each
	100g	<b>TS-88626</b>	1 Each

## HMDS (Hexamethyldisilazane)

The popular choice for silylation of sugars and related substances

- Greatly extends the practical range of GC, improving chromatographic results
- Suitable for deactivating and coating chromatographic supports
- Monofunctional, making polymerization not possible and eliminating surface moisture



**HMDS**  
 MW 161.4  
 bp 125°C  
 n<sub>D</sub><sup>20</sup> 1.4071

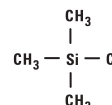
### HMDS

Description	Quantity	Cat. No.	Quantity
HMDS (Hexamethyldisilazane)	25g	<b>TS-84770</b>	1 Each

## TMCS (Trimethylchlorosilane)

An excellent catalyst for difficult-to-silylate compounds

- Excellent adjunct for forming trimethylsilyl ethers for GC determinations
- Used to prepare TMS derivatives of organic acids



**TMCS**  
 MW 108.7  
 bp 57.6°C  
 d<sub>4</sub><sup>20</sup> 0.858

### TMCS

Description	Quantity	Cat. No.	Quantity
TMCS	25g	<b>TS-88530</b>	1 Each

## MOX (Methoxamine) Reagent

Useful for preparing oximes of steroids and ketoacids prior to silylation

- 2% methoxyamine HCl (M.W. 83.51) in pyridine
- Prevents formation of multiple derivatives when enols are present during silylation

### MOX Reagent

Description	Quantity	Cat. No.	Quantity
MOX (Methoxamine) Reagent (2% methoxyamine•HCl in pyridine)	10mL	<b>TS-45950</b>	1 Each

## Tri-Sil HTP (HMDS:TMCS:Pyridine) Reagent

Reagent-catalyst mixture for one-step derivatization

- Derivatizes carbohydrates, phenols, steroids, sterols, organic acids, alcohols and some amines
- Useful for rapid production of TMS derivatives of polar compounds for gas chromatographic determination and biochemical synthesis
- The versatility, speed and ease of use of Tri-Sil HTP Reagent has made it the most widely used silylation formulation available

### Tri-Sil HTP Reagent

Description	Quantity	Cat. No.	Quantity
Tri-Sil HTP Reagent HMDS:TMCS:Pyridine (2:1:10)	10 × 1mL ampules	<b>TS-48999</b>	1 Pack
Tri-Sil HTP Reagent HMDS:TMCS:Pyridine (2:1:10)	50mL	X <b>TS-49001</b>	1 Each

X in the ordering table indicates that hazardous shipping charges apply.

## Tri-Sil BP (BSA:Pyridine) Reagent

Derivatizes alcohols, phenols, organic acids, aromatic amides and amines

Tri-Sil BP Reagent reacts with:

- Alcohols, phenols, some enols and other hydroxyl and polyhydroxyl compounds to form trimethylsilyl esters
- Organic acids to form trimethylsilyl esters
- Aromatic amides to form N-trimethylsilyl derivatives
- Amino acids to form both N- and O-trimethylsilyl derivatives
- Amines to form N-trimethylsilyl derivatives

### Tri-Sil BP Reagent

Description	Quantity	Cat. No.	Quantity
Tri-Sil BP Reagent (2.5mEq/mL BSA in pyridine)	25mL	<b>TS-49012</b>	1 Each



## Tri-Sil TBT (TMSI:BSA:TMCS) Reagent

A catalyzed silylation reagent formulation containing three parts TMSI, three parts BSA and two parts TMCS

- Converts all classes of hydroxyl groups to TMS ethers
- Under usual conditions, the reaction is complete in a short period of time at 60 to 80°C, although very hindered hydroxyls may require several hours

### Tri-Sil TBT Reagent

Description	Quantity	Cat. No.	Quantity
Tri-Sil TBT Reagent TMSI:BSA:TMCS (3:3:2)	10 × 1mL ampules	<b>TS-49016</b>	1 Pack

## Tri-Sil TP (TMSI:Pyridine) Reagent

Derivatizes hydroxyl compounds, particularly carbohydrates

- Silylates alcohols and phenols, organic acids, hydroxylamines, amino acids, carbohydrates, flavonoids, glycols and polyglycols, nucleotides, steroids, hydroxyl acids, barbiturates, narcotics, indoles and vitamins
- Does not react with amines
- May be used with water as long as there is enough reagent present to react with both the water and the sample

### Tri-Sil TP Reagent

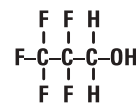
Description	Quantity	Cat. No.	Quantity
Tri-Sil TP Reagent TMSI: Pyridine (1:4)	10 × 1mL ampules	<b>TS-49230</b>	1 Pack
Tri-Sil TP Reagent TMSI: Pyridine (1:4)	25mL	<b>TS-49231</b>	1 Each

## Acylation Reagents

### Pentafluoropropanol

Purified for GC-MS applications

- Addition of fluorine atoms into compounds greatly enhances the sensitivity of certain detectors for all those materials
- Carboxylic acids can be derivatized using a two-step reaction involving reaction with anhydride, followed by a fluorinated alcohol



#### Pentafluoropropanol

MW 150.05  
bp 80.6°C  
d<sub>4</sub><sup>20</sup> 1.2880

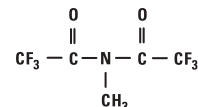
#### Pentafluoropropanol

Description	Quantity	Cat. No.	Quantity
Pentafluoropropanol	10 x 1mL ampules	<b>TS-65195</b>	1 Pack

## MBTFA

For trifluoroacetylating primary and secondary amines, hydroxyl and thiol groups and carbohydrates

- Reacts under non-acidic conditions
- Principle byproduct from the derivatization reaction is N-methyltrifluoroacetamide, which is stable, volatile and does not present problems in subsequent GC
- Produces very volatile derivatives of carbohydrates
- Can be used to selectively acylate amines in the presence of hydroxyl and carboxyl groups that have been protected by silylation



**MBTFA**  
MW 223.08  
bp 123-124°C  
d<sub>4</sub><sup>20</sup> 1.55

#### MBTFA

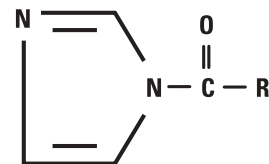
Description	Quantity	Cat. No.	Quantity
MBTFA [N-Methyl-bis(trifluoroacetamide)]	10 x 1mL ampules	<b>TS-49700</b>	1 Pack
	25mL	<b>TS-49703</b>	1 Each
	100mL	X <b>TS-49704</b>	1 Each
	5g	<b>TS-49701</b>	1 Each

X in the ordering table indicates that hazardous shipping charges apply.

## Perfluoroacylimidazoles (HFBI and TFAI)

Offer effective acylation of hydroxyl groups and primary and secondary amines

- Reactions are smooth, quantitative and produce no acid byproducts
- Excellent for FID and ECD techniques
- Derivatives are volatile, despite size of group
- Closely bound fluorines contribute to stability



R	Name	M.W.	Boiling Point
C <sub>3</sub> F <sub>7</sub>	HFBI	264.10	57 to 58°C/10mm
CF <sub>3</sub>	TFAI	164.08	38 to 40°C/14mm

### Perfluoroacylimidazoles (HFBI and TFAI)

Description	Quantity	Cat. No.	Quantity
HFBI	5g	* <b>TS-44211</b>	1 Each
TFAI	10 x 1mL ampules	<b>TS-48882</b>	1 Pack

\* indicates that additional dry ice and/or freight charges apply.

## Perfluoro Acid Anhydrides (TFAA, PFAA and HFAA)

Highly purified for optimal preparation of fluoracyl derivatives

- Used to prepare fluoracyl derivatives for GC-MS
- Produce stable volatile derivatives for FID and ECD techniques



### Perfluoro Acid Anhydrides

Description	Quantity	Cat. No.	Quantity
TFAA (Trifluoroacetic Acid Anhydride)	100g	X <b>TS-67363</b>	1 Each
PFAA (Pentafluoropropionic Acid Anhydride)	10 x 1mL ampules	<b>TS-65193</b>	1 Pack
PFAA	25g	X <b>TS-65192</b>	1 Each
PFAA	100g	X <b>TS-65191</b>	1 Each
HFAA (Heptafluorobutyric Acid Anhydride)	10 x 1mL ampules	<b>TS-63164</b>	1 Pack
HFAA	25g	X <b>TS-63163</b>	1 Each
HFAA	100g	X <b>TS-63162</b>	1 Each

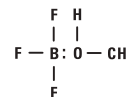
X in the ordering table indicates that hazardous shipping charges apply.

## Alkylation Reagents

### BF<sub>3</sub>-Methanol

Provides convenient, fast and quantitative esterification of fatty acids

- Supplied in septum-sealed Hypo-Vial Sample Storage Vial for convenient syringe removal
- Consists of 14% BF<sub>3</sub>, MW 67.82, and 86% CH<sub>3</sub>OH, MW 32.04



**BF<sub>3</sub>-Methanol**  
14% BF<sub>3</sub> MW 67.82  
86% CH<sub>3</sub>OH MW 32.04

#### BF<sub>3</sub>-Methanol

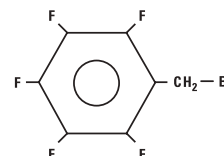
Description	Quantity	Cat. No.	Quantity
BF <sub>3</sub> -Methanol	100mL	X <b>TS-49370</b>	1 Each

X in the ordering table indicates that hazardous shipping charges apply.

## Pentafluorobenzyl Bromide (PFBBr)

For electron capture GC analysis of carboxyl acids, phenols and sulfonamides

- Fast reaction times for extraction alkylation technique: ~20 minutes
- Derivatives are highly EC-sensitive
- Analysis of trace organics in asphalt



**PFBBr**  
MW 260.9  
bp 174-175°C  
d<sub>4</sub><sup>20</sup> 1.86

#### Pentafluorobenzyl Bromide

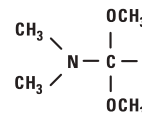
Description	Quantity	Cat. No.	Quantity
PFBBr (Pentafluorobenzyl Bromide)	5g	<b>TS-58220</b>	1 Each

## Methylate Reagent (DMFDMA)

For easy, effective preparation of methyl esters from fatty acids and amino acids

Advantages for preparation of methyl esters for gas chromatography:

- Speed: the reaction is complete upon dissolution (except long chain solid acids)
- No water washing, extraction or concentration of derivatives required
- No water formed
- Convenient: ready-to-use reagent contains 2mEq/mL pyridine



**Methylate Reagent**  
MW 119.17  
bp 102-104°C  
d<sub>4</sub><sup>20</sup> 0.897

#### Methylate Reagent

Description	Quantity	Cat. No.	Quantity
Methylate Reagent (N, N-Dimethylformamide dimethyl acetal)	25mL	<b>TS-49350</b>	1 Each

## MethElute Reagent (TMPAH)

Provides accurate sensitive on-column methylation

- 0.2M trimethylanilinium hydroxide (TMPAH) in methanol solution
- For quantitative methylation and detection of barbiturates, sedatives, xanthine bases, phenolic alkaloids and phenytoin by gas chromatography
- Single quantitative peak for each substance
- Comparable to or better than UV/TLC method (when phenobarbital and phenytoin are present, GC is superior to UV/TLC)
- Coefficient of variation is 5% or less
- Detects barbiturates to 0.2mg/dL

### MethElute Reagent

Description	Quantity	Cat. No.	Quantity
MethElute Reagent (TMPAH)	10mL	<b>TS-49300</b>	1 Each
MethElute Reagent (TMPAH)	12 × 1mL ampules	<b>TS-49301</b>	1 Pack



## Siliconizing Fluids

### Water-Soluble Siliconizing Fluid

Attaches the silane polymer, octadecyltrialkylsilane, to make the surface inert or polymerizes to create an inert film

- Easy-to-use silane monomer solution that is supplied as a 20% solid solution in a mixture of diacetone alcohol and tertiary butyl alcohol
- Greater resistance to base hydrolysis than other surface treatments
- Can be used on plastic surfaces

#### Water-Soluble Siliconizing Fluid

Description	Quantity		Cat. No.	Quantity
Siliconizing Fluid-Water Soluble	120mL	X	<b>TS-42799</b>	1 Each

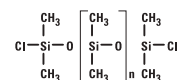
X in the ordering table indicates that hazardous shipping charges apply.

### Hydrocarbon-Soluble Siliconizing Fluid

Attaches a short-chain silane polymer to make the surface inert or polymerizes to create an inert film

When applied to glass, quartz or similar materials, the unhydrolyzed chlorines present on the chain react with surface silanols to form a neutral, hydrophobic and tightly bonded film over the entire surface.

- Soluble in organic solvents
- Excellent for modifying metals, glass, ceramics and fiber optics
- Can be used for certain plastic surfaces
- Well-suited for treatment of GC injection port liners



Siliconizing Fluid –  
Hydrocarbon Soluble

#### Hydrocarbon-Soluble Siliconizing Fluid

Description	Quantity		Cat. No.	Quantity
Siliconizing Fluid-Hydrocarbon Soluble	120mL	X	<b>TS-42800</b>	1 Each
Siliconizing Fluid-Hydrocarbon Soluble	480mL	X	<b>TS-42801</b>	1 Each

X in the ordering table indicates that hazardous shipping charges apply.



# Reacti-Therm Heating, Stirring and Evaporation System

Reliable and easy-to-use for constant temperatures and easy sample evaporation

Thermo Scientific Reacti-Therm and Reacti-Vap Evaporators provide the complete solution for derivatization and small-scale reactions.

- **Heating and Stirring Systems**

Unmatched convenience and versatility

- **Reacti-Vap**

Providing uniform dry heat to samples

- **Complete Solution**

For derivatization and small scale reactions

- **Complimentary Accessories**

Reacti-Vials and caps



Learn more about the Reacti-Therm and Reacti-Vap Systems.  
Visit [www.thermoscientific.com/columns](http://www.thermoscientific.com/columns)

## Reacti-Therm Heating and Stirring Modules

Reliable and easy-to-use for constant temperatures

- Uniform, stable heating: steady temperature incubation between ambient plus 10°C to 200°C
- LED display: match digital display to in-block thermometer to calibrate temperature set-point
- Modular design: switch aluminum blocks and vials; attach compatible evaporator manifold
- In-block temperature control option by Remote Temperature Probe, an optional accessory to allow temperature regulation from block wells or actual sample vials
- Magnetic stirrers for heating / stirring module for simultaneous stirring of samples in multiple vials

### Reacti-Therm Heating Modules

Type	Size of Unit	Cat. No.	Quantity
Heating Function	Single-block	<b>TS-18822</b>	1 Each
	Triple-block	<b>TS-18824</b>	1 Each
Remote Temperature Probe		<b>TS-18820</b>	1 Each

### Reacti-Therm Heating and Stirring Modules

Type	Size of Unit	Cat. No.	Quantity
Heating and Stirring Function	Single block	<b>TS-18821</b>	1 Each
	Triple-block	<b>TS-18823</b>	1 Each
Magnetic Stirrers for 3.0, 5.0 & 10.0mL Reacti-Vials		<b>TS-16000</b>	6 Pack
Magnetic Stirrers for 0.3 and 1mL Small Reaction Vials		<b>TS-16010</b>	6 Pack

### Applications:

- General sample incubation and evaporation in a variety of tube and vial sizes
- Silylation, alkylation and acylation derivatization reactions for GC sample preparation
- Protein hydrolysis and vacuum hydrolysis reactions for amino acid analysis by HPLC

## Reacti-Vap Evaporators

Manifolds for easy sample evaporation

- Integrated pressure-relief valve protects against excessive gas-flow and dangerous pressure build up
- Easy set-up: attach to corresponding Reacti-Therm Module, attach tubing from gas supply, and lower into position over samples and start gas flow
- Choose 9-port or 27-port model for compatibility with single-block and triple-block Reacti-Therm Modules, respectively

### Reacti-Vap Evaporators

No. of Ports	For Use With	Cat. No.	Quantity
9	Single-block Reacti-Therm Module	<b>TS-18825</b>	1 Each
27	Triple-block Reacti-Therm Module	<b>TS-18826</b>	1 Each

### Gas Regulators

Description	Cat. No.	Quantity
1/8" tube fitting	<b>60181-625</b>	1 Each
1/4" tube fitting	<b>60181-626</b>	1 Each



### Applications:

- General sample incubation and evaporation in a variety of tube and vial sizes
- Silylation, alkylation and acylation derivatization reactions for GC sample preparation



## Reacti-Block Aluminum Blocks

Optimal thermal conductivity

- Constructed of an aluminum alloy for optimal thermal conductivity
- Each Reacti-Block aluminium block contains a thermometer well
- Block dimensions are 9.4 L x 7.5 W x 5.1cm H for all blocks except for F, G, J and M which have a depth (height) of 7.6cm



### Reacti-Block Aluminum Blocks

Description		Cat. No
<b>Reacti-Block A-1</b> Holds 13 x 0.3mL or 1mL Reacti-Vials; 13 holes/14mm dia. x 23mm deep		TS-18801
<b>Reacti-Block B-1</b> Holds 9 x 3mL or 5mL Reacti-Vials; 9 holes/21mm dia. x 32mm deep		TS-18802
<b>Reacti-Block C-1</b> Holds 13 x 3.5mL Screw Cap Septum Vials; 13 holes/15mm dia. x 34mm deep		TS-18803
<b>Reacti-Block Z-1</b> Holds 9 x 0.1mL Reacti-Vials; 9 holes/12mm dia. x 21mm deep		TS-18804
<b>Reacti-Block M-1</b> Holds 6 x 27.5mL Reacti-Vials; 6 holes/28.5mm dia. x 70mm deep		TS-18811
<b>Reacti-Block S-1</b> Holds 13 x 13mm dia. Test Tubes; 13 holes/14mm dia. x 45mm deep		TS-18816
<b>Reacti-Block T-1</b> Holds 9 x 16mm dia. Test Tubes; 9 holes/17mm dia. x 45mm deep		TS-18817
<b>Reacti-Block U-1</b> Holds 8 x 20mm dia. Test Tubes; 8 holes/21mm dia. x 45mm deep		TS-18818
<b>Reacti-Block V-1</b> Holds 17 Microcentrifuge Test Tubes; 17 holes/11mm dia. x 45mm deep		TS-18819

The Reacti-Block aluminium blocks below are designed to be used exclusively with the Reacti-Therm modules. The hole patterns do not match the needle configuration of Reacti-Vap Evaporators.

Description		Cat. No
<b>Reacti-Block F</b> Holds 8 x 6mL Vacuum Hydrolysis Tubes; 8 holes/10mm dia. x 64mm deep		TS-18806
<b>Reacti-Block G</b> Holds 4 x 18mL Vacuum Hydrolysis Tubes; 4 holes/19mm dia. x 64mm deep		TS-18807
<b>Reacti-Block J</b> Blank/no holes (for custom drilling) 7.6cm tall		TS-18809
<b>Reacti-Block K</b> Blank/no holes (for custom drilling) 5.1cm tall		TS-18810
<b>Reacti-Block L</b> Holds 16 x 0.1mL Reacti-Vials; 16 holes/12mm dia. x 21mm deep		TS-18812

## Reacti-Therm Thermometers

Thermometers specially designed for use in dry block heaters

- Mercury-free: alcohol-filled for greater safety
- PTFE coating ensures that glass is impervious to corrosive materials
- Shock-resistant glass and coatings
- Standard laboratory size: 225mm length x 8mm diameter
- Compatible for use in Reacti-Therm Heating Modules and other laboratory equipment



### Reacti-Therm Thermometers

Min. Temperature (°C)	Max. Temperature (°C)	Cat. No.	Quantity
0	100	<b>TS-18914</b>	1 Each
0	200	<b>TS-18915</b>	1 Each

## Reacti-Vap Replacement Parts

### Reacti-Vap Replacement Parts

Description	Cat. No.	Quantity
Reacti-Vap Replacement Tube Kit 2.5 inch (64mm) (Tubes and Plugs)	<b>TS-18782</b>	9 Pack
Reacti-Vap PTFE-Coated Needles 102mm (4in) Length	<b>TS-18784</b>	9 Pack
Reacti-Vap PTFE-Coated Needles 152mm (6in) Length	<b>TS-18786</b>	9 Pack
Replacement Luer-Lok Fitting	<b>TS-18827</b>	1 Each
Replacement Screws for Mounting Bracket	<b>TS-18828</b>	4 Pack
Replacement Height Adjustment Knob	<b>TS-18829</b>	1 Each
Replacement Mounting Bracket	<b>TS-18830</b>	1 Each
Replacement Metal Rod	<b>TS-18831</b>	1 Each
Replacement Dial for Flow Control	<b>TS-18832</b>	1 Each
Replacement Long Screws for Mounting Bracket	<b>TS-18833</b>	4 Pack



## Vacuum Hydrolysis Tubes

For fast, effective protein and peptide hydrolysis

- The upper temperature limit of the Vacuum Hydrolysis Tubes is 260°C; however, do not heat the tubes greater than 100°C in an oven
- Vacuum hydrolysis tubes fit conveniently into Reacti-Block aluminium heating blocks



### Vacuum Hydrolysis Tubes

Volume (mL)	OD (mm)	Length (mm)	Cat. No.	Quantity
1	8	60	<b>TS-29570</b>	1 Each
6	10	150	<b>TS-29571</b>	1 Each
18	19	100	<b>TS-29572</b>	1 Each

## Reacti-Vial Small Reaction Vials

An internal cone makes small sample handling easy and convenient

- Extra thick glass wall magnifies the sample, making these vials ideal for observing chemical reactions
- Amber vials available for light-sensitive compounds
- Supplied complete with Open-Top Screw Caps and PTFE/Rubber Discs



### Reacti-Vial Small Reaction Vials

Capacity	Cat. No.	Quantity
<b>Amber</b>		
1mL	<b>TS-13097</b>	12 Pack
5mL	<b>TS-13099</b>	12 Pack
<b>Clear</b>		
100µL	<b>TS-13100</b>	12 Pack
300µL	<b>TS-13220</b>	12 Pack
1mL	<b>TS-13221</b>	12 Pack
3mL	<b>TS-13222</b>	12 Pack
5mL	<b>TS-13223</b>	12 Pack
10mL	<b>TS-13225</b>	12 Pack

### Applications:

- Residue isolation, derivative preparation, maximum sample retrieval, moisture protection, sample storage, precipitations, centrifugations, solvent evaporation

## Thermo Scientific Tuf-Bond PTFE/Silicone Discs

Discs that combine the inertness of PTFE with the resealability of silicone

- Structurally bonded PTFE to silicone; no cement to leak out of your sample after needle penetration
- Reseals instantly, puncture after puncture
- Autoclavable
- Compresses to maintain a tight seal forcing the PTFE to conform to the sealing surface
- Standard syringe and GC needles penetrate the entire disc with ease



### Thermo Scientific Tuf-Bond PTFE/Silicone Discs

Diameter (mm)	Fits	Cat. No.	Quantity
8	100µL Reacti-Vial Small Reaction Vials, 1.5mL Screw Cap Septum Vials	<b>TS-12708</b>	72 Pack
12	0.3 and 1mL Reacti-Vial Small Reaction Vials, 3.5mL Screw Cap Septum Vials	<b>TS-12712</b>	72 Pack
13	7mL Screw Cap Septum Vials	<b>TS-12713</b>	72 Pack
16	14mL Screw Cap Septum Vials; 15mL (0.5 oz.) Screw Cap Bottles	<b>TS-12716</b>	72 Pack
18	3 and 5mL Reacti-Vial Small Reaction Vials	<b>TS-12718</b>	72 Pack
22	25 and 40mL Screw Cap Septum Vials, 240mL (8 oz.) Screw Cap Bottles, 10mL Reacti-Vial	<b>TS-12722</b>	72 Pack

## PTFE/Rubber Laminated Discs

Provides a highly inert and unreactive seal

- Constructed of white pharmaceutical rubber with PTFE bonded to one side
- Discs are autoclavable with no loss of integrity after heating above 100°C for 5 hours



### PTFE/Rubber Laminated Discs

Diameter (mm)	Fits	Cat. No.	Quantity
12	0.3 and 1mL Reacti-Vial Small Reaction Vials, 2 and 3.5mL Screw Cap Septum Vial	<b>TS-12412</b>	72 Pack
18	3 and 5mL Reacti-Vial Small Reaction Vials; 10 and 25mL Reacti-Flask	<b>TS-12418</b>	72 Pack

## Open-Top Screw Caps

Provide inert, air-tight seal and direct puncture-access to sample with a syringe needle

- Fits into Reacti-Vial Small reaction vials
- Used with PTFE/Rubber laminated discs



### Open-Top Screw Caps

Fits	Cat. No.	Quantity
3 and 5mL Reacti-Vials	<b>TS-13218</b>	72 Pack
0.3 and 1.0mL Reacti-Vials, 3.5mL Screw Cap Septum Vial	<b>TS-13215</b>	72 Pack
10mL Reacti-Vials, 40mL Screw Cap Septum Vials	<b>TS-13219</b>	72 Pack

## Screw Cap Septum Vials

Economy, convenience and versatility in a vial and closure system

- Flat bottom vials
- Heavy-duty flip-top divider box provides easy access to vials, caps and septa and offers a convenient sample storage center
- Storage of reagents and standards under complete seal with instant syringe access



### Screw Cap Septum Vials

Capacity (mL)	Cat. No.	Quantity
<b>Clear</b>		
3.5	<b>TS-13019</b>	72 Pack
7	<b>TS-13028</b>	72 Pack

**Ordering Alerts:** Septa not included with vials; must be ordered separately.

## Mininert Valves

Excellent closures for chemicals that deteriorate or evaporate through conventional vial caps and seals

Thermo Scientific™ Mininert™ Valves are screw caps that have integrated resealable valves to allow repeated and unlimited syringe-needle access to samples. Slide the valve one way to open the needle-port. Slide the valve back to close and completely seal the close.

- Available in two sizes – 20mm (thread size 20/400) and 27mm (thread size 24/400) to fit 3 and 5mL Reacti-Vial Small Reaction Vials and 40mL Screw Cap Septum Vials, respectively
- Precision crafted from PTFE plastic for repeated use and chemical resistance
- Valve design eliminates the septum-boring that occurs with repeated puncture of traditional septa



### Mininert Valves

Size (mm)	Fits	Cat. No.	Quantity
20	Fits 3 and 5mL Reacti-Vial Small Reaction Vials	<b>TS-10135</b>	12 Pack
27	Fits 40mL Screw Cap Septum Vials	<b>TS-10130</b>	12 Pack

## GC and GC-MS Instruments

Our gas chromatography and mass spectrometry instruments offer solutions to food, environmental, pharmaceutical laboratories and industrial customers. Our instruments stimulate to advance scientific knowledge, enable drug discovery and to improve manufacturing processes. Using our GC and GC-MS you can expect the best results and highest level of productivity to keep your research or processes moving smoothly.

### TRACE 1300 Series GC

- User-installable injectors and detectors
- Easy adoption of standard GC methods
- Unmatched detector sensitivity in trace analysis
- Increased robustness of injector technology
- Shorter sample cycle time



For routine GC and GC-MS laboratories that need flexibility for a wide range of applications, the Thermo Scientific™ TRACE™ 1300 Series GC Gas Chromatograph is the latest technology to simplify workflow and increase analytical performance.

The TRACE 1300 Series offers the most versatile GC platform in the market, with unique instant connect modularity for ground-breaking ease of use and performance, setting a new era in GC technology. GC users now have the unique ability to easily configure the system themselves, to increase throughput or for a rapid exchange of configurations, with the added benefit of continuous operation since modules can be swapped and routine maintenance performed offline to fit laboratory's schedule.

Visit [www.thermoscientific.com/trace1300](http://www.thermoscientific.com/trace1300)

### TriPlus RSH Autosampler

- Reliable GC and GC-MS automation
- Liquid injection/headspace/SPME, all-in-one unattended sequence
- Enhanced productivity and powerful versatility in sample preparation

The Thermo Scientific™ TriPlus™ RSH Autosampler offers scalable flexibility from simple liquid injection to extended sample preparation. An innovative Automated Tool Change (ATC) station addresses sampling demand and selects the most suitable syringe during a sequence. Up to 6 different syringes can be programmed in a sequence for extended sample preparation capabilities and different sampling modes (liquid, HS, SPME). Unsurpassed sample handling flexibility combined with high sample capacity, places no limits even to more stringent productivity requirements. Multiple sample trays increase unattended operation up to 972 x 2mL vials. The unique Bottom Vial Sensing feature secured syringe depth positioning in your vial for the last  $\mu$ L sample. Even nanovolume injections through the use of plunger-in-needle syringes can be programmed in a flexible sequence. All these, combined with large volume injections deliver unsurpassed sample handling flexibility.

Visit [www.thermoscientific.com/triplusrsh](http://www.thermoscientific.com/triplusrsh)



## AI/AS 1310 Autosampler

- Automated liquid injection systems for all Thermo Scientific GC and GC-MS systems
- Performance and simplicity in liquid sampling
- “Tool-Free” upgradability from 8 to 155 vial positions

Engineered to meet the highest level requirements of ruggedness and ease-of-use, the AI/AS 1310 automatic sampling system is ideal for high throughput and QA/QC control on the Thermo Scientific GC and GC/MS product portfolio. Utmost precision and ease-of-use of the plug and inject concept are combined in the available configurations: 8-position single module system for small batches of samples; 155 position tray system for high sample throughput. Boost productivity further with the Gemini configuration, which allows two autosamplers to be mounted on the same GC, serving two injection ports simultaneously.

Visit [www.thermoscientific.com](http://www.thermoscientific.com)



*AI 1310 mounted onto a TRACE 1310 GC*



*AS 1310 155-vial Autosampler mounted on a TRACE 1300 GC with ISQ Mass Spectrometer*

## TriPlus 300 Headspace Autosampler

- Unprecedented productivity and accelerated analytical results
- High throughput operations with expanded sample capacity
- Ideal for organic volatiles analysis

The Thermo Scientific™ TriPlus™ 300 Headspace valve-and-loop autosampler offers a quick start-up and enables reliable, unattended and high throughput operations with expanded sample capacity. Its ability to fully comply with existing methods in pharmaceutical, forensic and environmental laboratories makes TriPlus 300 HS the product of choice for automated and dependable organic volatiles determinations.

Combined with the user-configurable TRACE 1300 Series GC and supported by a range of chromatography data systems that offer comprehensive system control, TriPlus 300 HS delivers unprecedented productivity and accelerated analytical results within the laboratory workflow.

Visit [www.thermoscientific.com/triplus300](http://www.thermoscientific.com/triplus300)



## ISQ Series Single Quadrupole GC-MS

- Unique Full Source Removal™ capability delivers maximum uptime and unstoppable productivity
- ExtractaBrite™ solid, inert ion source provides robust operations and low detection limits
- Versatile and flexible for a broad range of applications

The Thermo Scientific™ ISQ™ Series single quadrupole GC-MS system features time-proven technology developed with the accumulation of almost 50 years of mass spectrometry innovation, offering an affordable and robust solution. This GC-MS series offers operational simplicity, proven dependability, and unstoppable productivity.

The ISQ QD GC-MS offers quality design, MS operational simplicity, and proven dependability for QA/QC and low-to medium-throughput production environments, as well as in teaching and academic facilities.

For analytically-demanding, high-throughput laboratories, requiring utmost sensitivity and unstoppable productivity, the ISQ LT GC-MS does not need to be vented to exchange the source, and it boasts the lowest detection limits and unlimited flexibility.

Visit [www.thermoscientific.com/isq](http://www.thermoscientific.com/isq)



## TSQ 8000 Evo GC-Triple Quadrupole MS

- Unique full source removal capability delivers maximum uptime and unstoppable productivity
- ExtractaBrite™ solid, inert ion source provides robust operations and low detection limits
- Unprecedented ease of use with innovative AutoSRM software

The Thermo Scientific™ TSQ™ 8000 Evo Gas Chromatograph/Triple Quadrupole Mass Spectrometer offers the easiest way to achieve the lower detection limits and reduced sample preparation allowed by selected reaction monitoring (SRM). The TSQ 8000 Evo GC-MS/MS is the first triple quadrupole GC-MS/MS system to offer an extractable ion source under vacuum and software that fully automates SRM development.

Visit [www.thermoscientific.com/tsq8000](http://www.thermoscientific.com/tsq8000)





## TSQ™ Duo Triple Quadrupole GC-MS/MS

- AutoSRM: provides automated method development and method maintenance software
- SIM Bridge: assists transitioning from SIM to SRM methods
- Portable methods: use existing methods or develop master methods on the TSQ 8000 Evo in the core lab and run them on the TSQ Duo system in field labs
- Chromeleon CDS software: MS control and data processing
- Timed Acquisition upgrade: when your methods grow in analyte number
- Excellent performance in Full Scan mode, with NIST MS Library searchable spectra
- User-installable modules: can be changed in less than two minutes

This GC-MS/MS is like no other. The Thermo Scientific™ TSQ™ Duo GC-MS/MS system is tailored to chromatographers and single quadrupole GC-MS users who need easy access to powerful new MS/MS workflows and who need to satisfy current method requirements. The system provides excellent performance in both single and triple quadrupole modes that is easily achievable, even for less experienced users. The TSQ Duo is the only cost-sensitive instrument featuring efficient, simply intelligent software workflows made possible by Thermo Scientific™ Dionex™ Chromeleon™ Chromatography Data System (CDS) software.

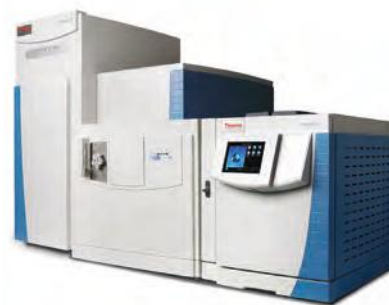
Visit [www.thermoscientific.com/tsqduo](http://www.thermoscientific.com/tsqduo)



## Q Exactive GC Orbitrap GC-MS/MS

Bring the power of the first-ever combination of high-resolution gas chromatography (GC) and high-resolution/accurate-mass (HR/AM) Orbitrap mass spectrometry to your laboratory. The Thermo Scientific™ Q Exactive™ GC Orbitrap™ GC-MS/MS system provides comprehensive characterization of samples in a single analysis for the highest confidence in compound discovery, identification, and quantitation. Q Exactive GC offers the quantitative power of a GC triple quadrupole MS combined with the high performance, full scan HR/AM capabilities that are only possible with Orbitrap MS technology.

Visit [www.thermoscientific.com/qexactivegc](http://www.thermoscientific.com/qexactivegc)



# Terms and Conditions of Sale

UNLESS OTHERWISE EXPRESSLY AGREED IN WRITING, ALL SALES ARE SUBJECT TO THE FOLLOWING TERMS AND CONDITIONS:

1. **GENERAL.** Thermo Fisher Scientific ("Seller") hereby offers for sale to the buyer named on the face hereof ("Buyer") the products listed on the face hereof (the "Products") on the express condition that Buyer agrees to accept and be bound by the terms and conditions set forth herein. Any provisions contained in any document issued by Buyer are expressly rejected and if the terms and conditions in this Agreement differ from the terms of Buyer's offer, this document shall be construed as a counter offer and shall not be effective as an acceptance of Buyer's document. Buyer's receipt of Products or Seller's commencement of the services provided hereunder will constitute Buyer's acceptance of this Agreement. This is the complete and exclusive statement of the contract between Seller and Buyer with respect to Buyer's purchase of the Products. No waiver, consent, modification, amendment or change of the terms contained herein shall be binding unless in writing and signed by Seller and Buyer. Seller's failure to object to terms contained in any subsequent communication from Buyer will not be a waiver or modification of the terms set forth herein. All orders are subject to acceptance in writing by an authorized representative of Seller.

2. **PRICE.** All prices published by Seller or quoted by Seller's representatives may be changed at any time without notice. All prices quoted by Seller or Seller's representatives are valid for thirty (30) days, unless otherwise stated in writing. All prices for the Products will be as specified by Seller or, if no price has been specified or quoted, will be Seller's price in effect at the time of shipment. All prices are subject to adjustment on account of specifications, quantities, raw materials, cost of production, shipment arrangements or other terms or conditions which are not part of Seller's original price quotation.

3. **TAXES AND OTHER CHARGES.** Prices for the Products exclude all sales, value added and other taxes and duties imposed with respect to the sale, delivery, or use of any Products covered hereby, all of which taxes and duties must be paid by Buyer. If Buyer claims any exemption, Buyer must provide a valid, signed certificate or letter of exemption for each respective jurisdiction.

4. **TERMS OF PAYMENT.** Seller may invoice Buyer upon shipment for the price and all other charges payable by Buyer in accordance with the terms on the face hereof. If no payment terms are stated on the face hereof, payment shall be net thirty (30) days from the date of invoice. If Buyer fails to pay any amounts when due, Buyer shall pay Seller interest thereon at a periodic rate of one and one-half percent (1.5%) per month (or, if lower, the highest rate permitted by law), together with all costs and expenses (including without limitation reasonable attorneys' fees and disbursements and court costs) incurred by Seller in collecting such overdue amounts or otherwise enforcing Seller's rights hereunder. Seller reserves the right to require from Buyer full or partial payment in advance, or other security that is satisfactory to Seller, at any time that Seller believes in good faith that Buyer's financial condition does not justify the terms of payment specified. All payments shall be made in U.S. Dollars.

5. **DELIVERY; CANCELLATION OR CHANGES BY BUYER.** The Products will be shipped to the destination specified by Buyer, F.O.B. Seller's shipping point. Seller will have the right, at its election, to make partial shipments of the Products and to invoice each shipment separately. Seller reserves the right to stop delivery of Products in transit and to withhold shipments in whole or in part if Buyer fails to make any payment to Seller when due or otherwise fails to perform its obligations hereunder. All shipping dates are approximate only, and Seller will not be liable for any loss or damage resulting from any delay in delivery or failure to deliver which is due to any cause beyond Seller's reasonable control. In the event of a delay due to any cause beyond Seller's reasonable control, Seller reserves the right to terminate the order or to reschedule the shipment within a reasonable period of time, and Buyer will not be entitled to refuse delivery or otherwise be relieved of any obligations as the result of such delay. Products as to which delivery is delayed due to any cause within Buyer's control may be placed in storage by Seller at Buyer's risk and expense and for Buyer's account. Orders in process may be canceled only with Seller's written consent and upon payment of Seller's cancellation charges. Orders in process may not be changed except with Seller's written consent and upon agreement by the parties as to an appropriate adjustment in the purchase price therefor. Credit will not be allowed for Products returned without the prior written consent of Seller.

6. **TITLE AND RISK OF LOSS.** Notwithstanding the trade terms indicated above and subject to Seller's right to stop delivery of Products in transit, title to and risk of loss of the Products will pass to Buyer upon delivery of possession of the Products by Seller to the carrier; provided, however, that title to any software incorporated within or forming a part of the Products shall at all times remain with Seller or the licensor(s) thereof, as the case may be.

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# Resources

## for Chromatographers



### Chromatography Resource Center

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