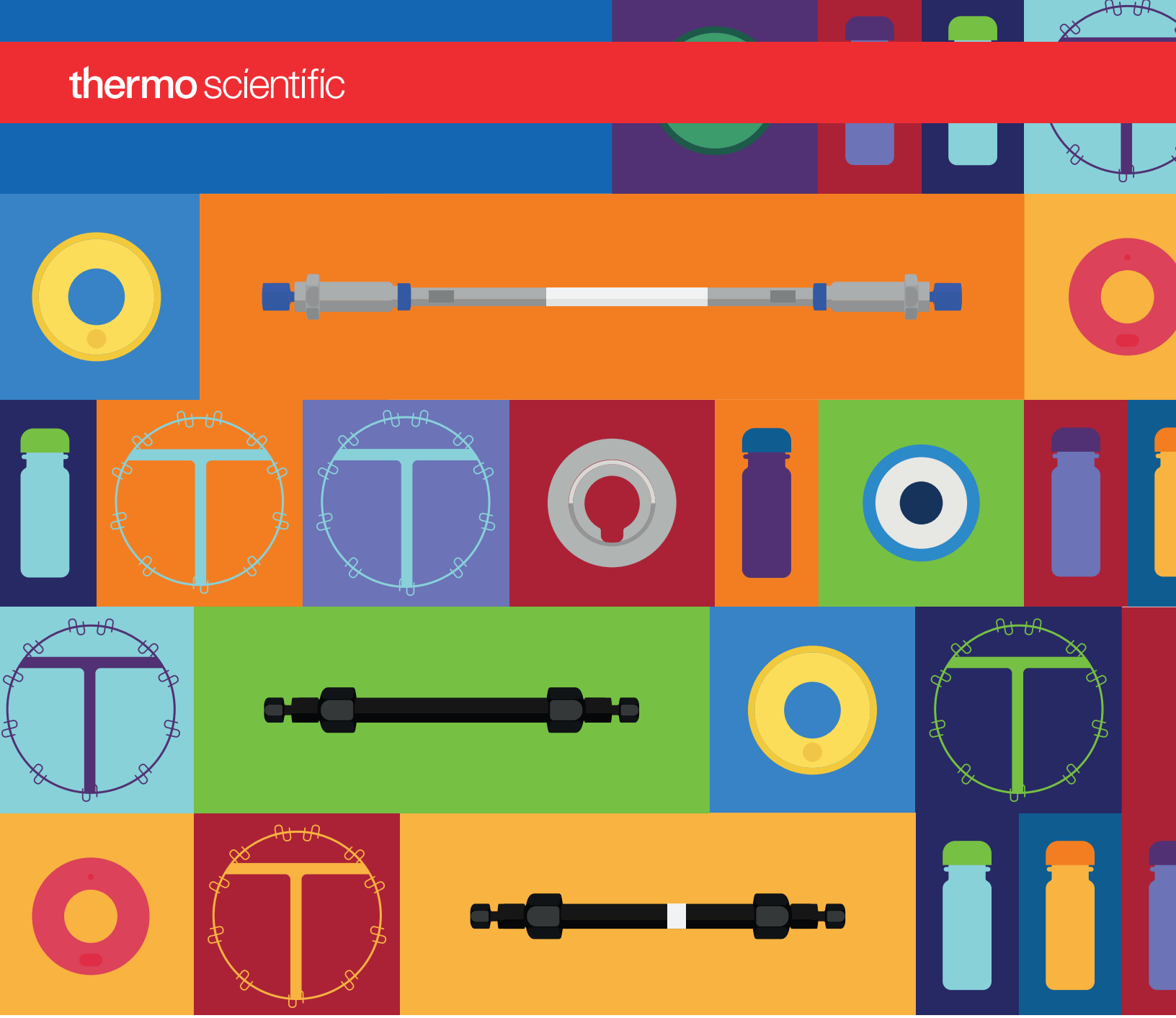
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# Connected chromatography solutions

## 2019/2021 Chromatography Consumables Catalog

ThermoFisher SCIENTIFIC

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# The collective power of chromatography

## Expect reproducible results with sample prep, columns and vials

Maximizing your chromatography productivity and achieving reproducible results requires optimizing the whole workflow from sample to knowledge. By choosing the right tools, from your sample preparation (manual or automated) to the highest selectivity column chemistry and cleanest vials, you maintain sample integrity and achieve the highest instrument efficiency and reduce the need for costly reanalysis. With the largest portfolio of sample handling; vials, plates and closures, column chemistries in a broad range of dimensions and sample preparation, we remain a steadfast and committed partner in your endeavor to improve the world around us.

GC | IC | LC

C | CDS | SP

UNITY LAB SERVICES

Find out more at **thermofisher.com/chromatographyconsumables**

ThermoFisher SCIENTIFIC

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**AD72973-EN 0419S**

# 2019/2021 Chromatography Consumables Catalog

This PDF catalogue is designed to familiarise you with our comprehensive portfolio of Chromatography consumables, columns and accessories, designed to deliver connected chromatography solutions across Biopharma/Pharma, Food & Beverage, Environmental and Clinical workflows. We have included key workflows in the next few pages to help with your product selection.

**How to use this PDF catalog**

You can use the 'ctrl F' function to search for products, applications, brands or part numbers, or you can navigate by section using the contents page to guide you.

**More information**

For more information on Chromatography consumables, to access application notes, educational resources, selection guides and product literature, please visit **thermofisher.com/chromatographyconsumables**

Or, for more information on our Instrumentation and key applications, please visit **thermofisher.com/chromatography**

## AppsLab

Gain access to our applications expertise on cloud-based Thermo Scientific™ AppsLab library of analytical applications for a comprehensive fully searchable method repository.

Visit **appslab.thermofisher.com**

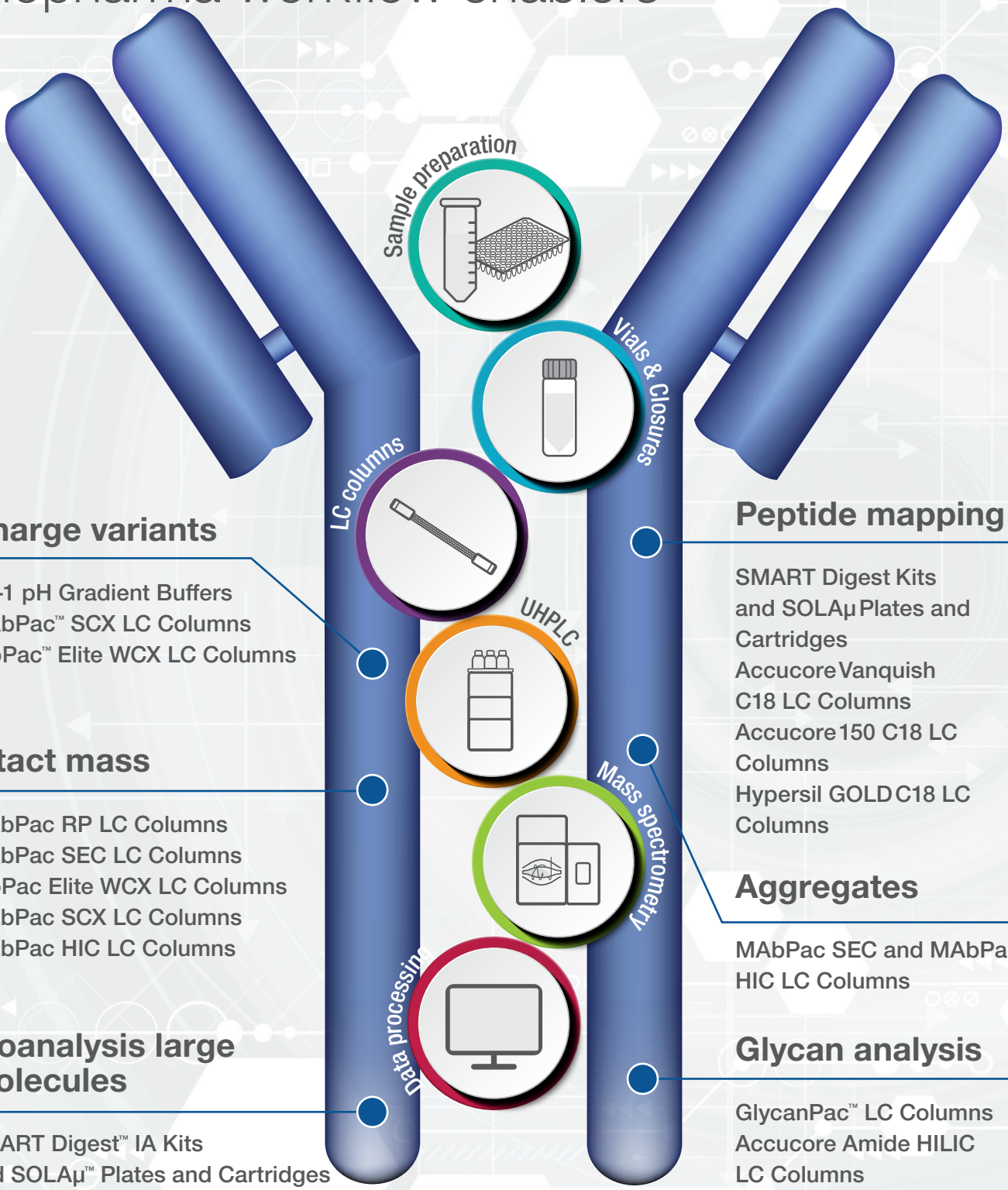
## A collaboration built for Biopharma

The National Institute for Bioprocessing Research and Training (NIBRT) and Thermo Fisher Scientific are developing workflows using Thermo Fisher Scientific technology including the latest biomolecule columns.

For more information on collaboration built for BioPharma visit **thermofisher.com/NIBRT**

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# Thermo Scientific™ Biopharma workflow enablers




## Charge variants

CX-1 pH Gradient Buffers
MAbPac™ SCX LC Columns
ProPac™ Elite WCX LC Columns

## Intact mass

MAbPac RP LC Columns
MAbPac SEC LC Columns
ProPac Elite WCX LC Columns
MAbPac SCX LC Columns
MAbPac HIC LC Columns

## Bioanalysis large molecules

SMART Digest™ IA Kits
and SOLAμ™ Plates and Cartridges
Accucore™ Vanquish™ C18 LC Columns
Acclaim™ LC Columns
Hypersil GOLD™ C18 LC Columns

## Peptide mapping

SMART Digest Kits
and SOLAμ Plates and Cartridges
Accucore Vanquish C18 LC Columns
Accucore 150 C18 LC Columns
Hypersil GOLD C18 LC Columns

## Aggregates

MAbPac SEC and MAbPac HIC LC Columns

## Glycan analysis

GlycanPac™ LC Columns
Accucore Amide HILIC LC Columns

Find out more about consumables for your Biopharma workflow here

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# Thermo Scientific™ Pharmaceutical workflow enablers

## Small molecules

### Discovery DMPK

HyperSep™ SPE Cartridges and Plates
WebSeal™ Well Plates and Mats
Accucore™ RP-MS LC Columns
Accucore Biphenyl LC Columns
Acclaim™ VANQUISH™ C18 UHPLC Columns
Titan3™ Syringe Filters

### Development DMPK / Pre Clinical

SOLA™/SOLAμ™ SPE Plates and Cartridges
WebSeal Well Plates and Mats
HyperSep SPE Cartridges and Plates
Accucore C18 LC Columns
Accucore Biphenyl LC Columns
Hypersil GOLD™ VANQUISH™ C18 UHPLC Columns

### Clinical

SOLA/SOLAμ SPE Plates and Cartridges
WebSeal Well Plates and Mats
Hypersil GOLD VANQUISH C18 UHPLC Columns
Accucore C18 LC Columns
Accucore Biphenyl LC Columns

### QA/QC

Titan3 Syringe Filters
Hypersil GOLD C18 UHPLC Columns
Accucore RP-MS LC Columns
Accucore Biphenyl LC Columns
TraceGOLD™ GC Columns




## Large molecules

### Discovery DMPK

SMART Digest™ Kits
WebSeal Well Plates and Mats
MAbPac™ LC Columns
ProPac™ Elite WCX LC Column
GlycanPac™ LC Columns
Acclaim 120 C18 Columns
CX-1 pH Gradient Buffers

### Development DMPK / Pre Clinical

SMART Digest & SMART Digest ImmunoAffinity Kit
SOLA/SOLAμ SPE Plates and Cartridges
WebSeal Well Plates and Mats
Acclaim 120 C18 Columns

### Clinical

SOLA/SOLAμ SPE Plates and Cartridges
WebSeal Well Plates and Mats
Acclaim 120 C18 Columns

### QA/QC

Titan3 Syringe Filters
SMART Digest Kits
ProPac LC Columns
MAbPac LC Columns
CX-1 pH Gradient Buffers
Acclaim 120 C18 Columns

Find out more about consumables for your Pharmaceutical workflow here

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# Thermo Scientific™ Food and Beverage workflow enablers




## Pesticides

HyperSep™ SPE Cartridges
QuEChERS
TraceGOLD™ GC Columns
GC Consumables
and Accessories
Accucore™ aQ LC Columns
Acclaim™ Carbamate
LC Columns
Acclaim Trinity Q1 LC Columns

## Mycotoxins

HyperSep Retain Cartridges
Accucore aQ LC Columns
Hypersil GOLD™ LC Columns

## Contaminants by GC-MS

HyperSep SPE Cartridges
TraceGOLD GC Columns
GC Consumables and
Accessories

## Veterinary drug residues

QuEChERS
Target2™ PTFE Syringe
Filters
Accucore VDX LC Columns

## Food quality/ Food labelling / Food fraud

HyperSep Retain Cartridges
HyperSep SPE Cartridges
Acclaim LC Columns
Accucore LC Columns
HyperREX™ LC Columns
GC Columns and
Consumables

Find out more about consumables for your Food & Beverage workflow here

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# Thermo Scientific™ Environmental workflow enablers




## Persistent Organic Pollutants (POP)

HyperSep™ Cartridges
TraceGOLD™ GC Columns
LinerGOLD™ GC Liners
BTO Septa
GC Consumables and Accessories

## Semi-Volatile Organic Compounds (SVOC)

HyperSep Cartridges
SPME Arrow
TraceGOLD TG-XLBMS, TG-5SilMS, TG-PAH, TG-XLBMS, TG-OCP, TG-OPP TR-Pesticide, and TR-8270 GC Columns
LinerGOLD Liners
BTO Septa
GC Consumables and Accessories

## Volatile Organic Compounds (VOC)

SPME Arrow
TraceGOLD TG-VMS, TG-VRX, TG-624, TG-624SilMS, TG-VVOC B, TRACE™ TR-V1, TR-524, and TracePLOT GC Columns
LinerGOLD Liners
BTO Septa
GC Consumables and Accessories

## Microcystins

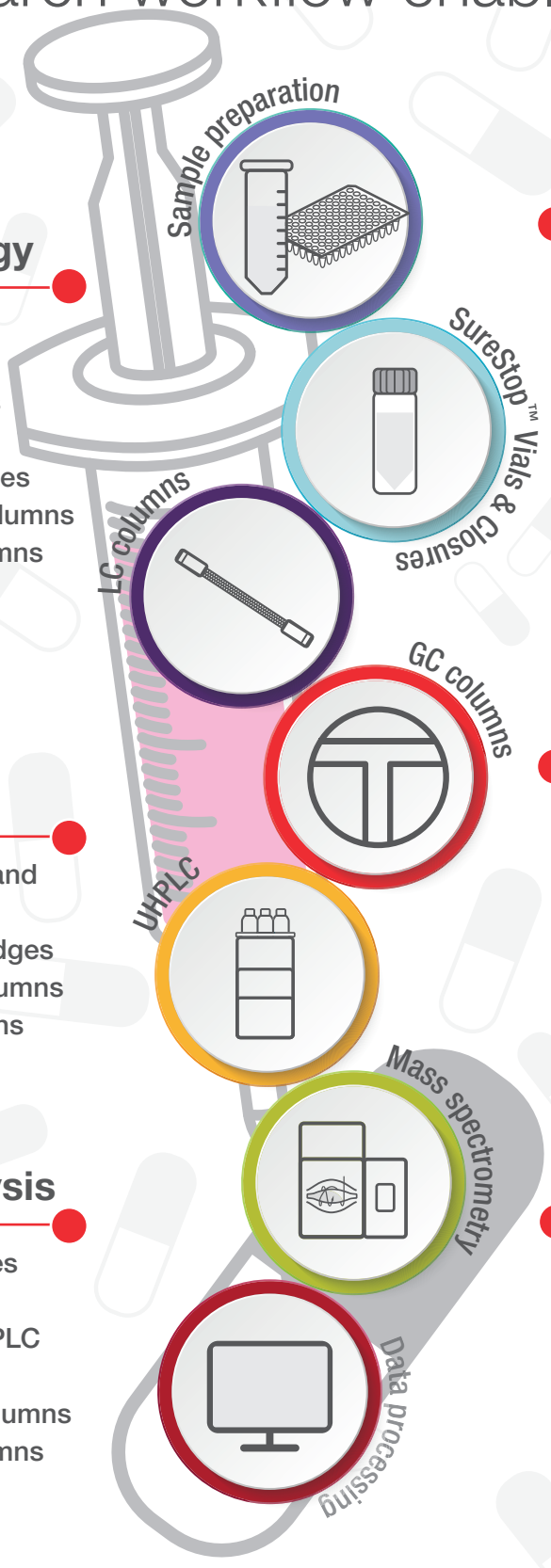
HyperSep Cartridges
Hypersil GOLD™ aQ LC Columns
Accucore™ C18 LC Columns

Find out more about consumables for your Environmental workflow here

ThermoFisher SCIENTIFIC

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# Thermo Scientific™ Clinical research workflow enablers




## Forensic toxicology

SOLA™/SOLAμ™ SPE Plates and Cartridges
HyperSep™ SPE Cartridges and Plates
HyperSep™ Retain Cartridges
Accucore™ Biphenyl LC Columns
Accucore RP-MS LC Columns
TraceGOLD™ GC Columns and Guard Columns

## Drugs of abuse research

SOLA/SOLAμ SPE Plates and Cartridges
HyperSep Verify CX Cartridges
Accucore Biphenyl LC Columns
Hypersil GOLD™ LC Columns
TraceGOLD GC Columns

## Supplement analysis

HyperSep Retain Cartridges and Plates
Hypercarb™ HPLC and UHPLC Columns
Hypersil GOLD PFP LC Columns
Accucore aQ C18 LC Columns

## Amino acids, acylcarnitines, and succinylacetone research

Hypersil GOLD C18 LC Columns
Accucore aQ C18 LC Columns
Acclaim™ HILIC LC Columns
Titan3™ Syringe Filters
HyperSep SLE Plates and Cartridges
TraceGOLD GC Columns

## Translational proteomics

SMART Digest™ Kits
SOLAμ SPE Plates and Cartridges
EASY-Spray™ LC Columns
PepMap™ RSLC Columns
WebSeal™ Well Plates and Mats

## Drug monitoring research

SOLA/SOLAμ SPE Plates and Cartridges
WebSeal Well Plates and Mats
Acclaim 120 C18 Columns

Find out more about consumables for your Clinical workflow here

ThermoFisher SCIENTIFIC

# 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.

For more information, visit **thermofisher.com/GCcolumns**

## Featured products




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

Page 5-017



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

Page 5-034

# Section contents


| | |
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| Injection port septa | 5-015 |
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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.

Page 5-077




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

Page 089

# 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




Thermo Scientific GC consumables are available for both Thermo Scientific and Agilent instruments.

## 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 |
|---|---|---|
| Split  | Enables rapid vaporization and effective mixing of sample | • Typically open-ended<br>• Large surface area & volume<br>• Design to aid mixing<br>• Low activity |
| Splitless  | Sample focused onto column – minimizes sample contact with reactive metal components | • Typically tapered<br>• Small volume to aid transfer<br>• Low activity |
| PTV  | Rapid heating and cooling, fast transfer to column-used for active compounds such as pesticides and large volume injections | • Small to aid sample transfer<br>• Good thermal properties for rapid heating & cooling<br>• Siltek coating provides highly inert surface |

## GC syringes

### Syringe selection by needle tip style

| Needle Tip Style | Features / Applications |
|---|---|
| Cone (Tapered tip)  | Most versatile needle for autosampler use and resist coring of vial and inlet septa |
| Bevel (Sharp tip)  | Typically used for manual injections. The tip shape helps reduce septa coring |
| Side Hole (Dome tip with a side hole for sample exit)  | Usually used for headspace and large volume injections |
| Blunt End or 90° (flat top)  | Used for injectors that do not contain an inlet septa such as Merlin MicroSeal™ |
| Dual Gauge  | 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 | • Easy-to-use stable seal<br>• Higher temperature limit<br>• Can be easily removed<br>• Can be re-used | • Not for MS or oxygen-sensitive detectors<br>• Soft, easily deformed or destroyed<br>• Possible system contamination |
| 85% Vespel / 15% Graphite | MS and oxygen-sensitive detectors | • Long lifetime<br>• High temperature limit<br>• MS compatible | • Cannot be re-used<br>• Must be re-tightened after initial temperature cycles |
| Thermo Scientific™ SilTite™ | MS and oxygen-sensitive detectors | • Long lifetime<br>• High temperature limit<br>• MS compatible | • Cannot be re-used |

## 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.<br>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 |

# Gas management

## Thermo Scientific™ 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, $H_2$, $N_2$, AR, Air | | 21g $H_2O$ | 7.2g $H_2O$ |
| Oxygen | Inert carrier, He, $H_2$, $N_2$, AR | | 3L $O_2$ | 1L $O_2$ |
| Hydrocarbon | Inert carrier, He, $H_2$, $N_2$, AR, Air | | 36g (as n-butane) | 24g (as n-butane) |
| Combi – Moisture, Oxygen | Inert carrier, He, $H_2$, $N_2$, AR | | 10g $H_2O$, 1.5L $O_2$ | – |
| Combi – Moisture, Hydrocarbons | Inert carrier, He, $H_2$, $N_2$, AR, Air | | 10g $H_2O$, 18g HCs (as n-butane) | 3.5g $H_2O$, 12g HCs (as n-butane) |
| Triple – Moisture, Oxygen, Hydrocarbons | Inert carrier, He, $H_2$, $N_2$, AR | | 6g $H_2O$, 1L $O_2$, 12g HCs (as n-butane) | 1.8g $H_2O$, 500mL $O_2$, 7g HCs (as n-butane) |
| Triple– Moisture, Oxygen, Hydrocarbons – He preconditioned for GC/MS | He | | 6g $H_2O$, 1L $O_2$, 12g HCs (as n-butane) | – |
| Indicating Triple – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC/MS | He | Moisture: Yellow to Clear Oxygen: Green to Gray | 0.1g $H_2O$, 100mL $O_2$, 0.07g HCs (as n-butane) | – |

### Click-on inline filters

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

### Connectors and accessories

| Description | Cat No. | Quantity |
|---|---|---|
| Brass End Fitting, 0.125in. | 60180-809 | 2 Pack |
| Steel End Fitting, 0.125in. | 60180-810 | 2 Pack |
| Brass End Fitting, 0.25in. | 60180-811 | 2 Pack |
| Steel End Fitting, 0.25in. | 60180-812 | 2 Pack |
| Double Ended Connector to connect Filter to Indicator | 60180-813 | 1 Each |
| Replacement O-Rings | 60180-833 | 1 Each |
| Wall Mounting Clamp | 60180-834 | 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 | 60180-819 | 1 Each |
| Indicating Oxygen Cartridge Filter | No | 60180-820 | 1 Each |
| Hydrocarbon Cartridge Filter | No | 60180-821 | 1 Each |
| Indicating Combi Filter – Moisture, Hydrocarbons | No | 60180-826 | 1 Each |
| Indicating Triple Filter – Moisture, Oxygen, Hydrocarbons | No | 60180-824 | 1 Each |
| Indicating Triple Filter – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC-MS | No | 60180-825 | 1 Each |
| Triple Filter – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC-MS | Yes | 60180-830 | 1 Each |
| Indicating Triple Filter – Moisture, Oxygen, Hydrocarbons – He preconditioned for GC-MS | Yes | 60180-829 | 1 Each |
| 3 Cartridge Pack – contains 1 x Triple Filter and 2 x Combi Filter (Moisture, Hydrocarbons) | No | 60180-822 | 1 Each |
| 4 Cartridge Pack – contains 1 x Moisture Filter, 1 x $O_2$ Filter and 2 x Hydrocarbon Filter | Yes | 60180-827 | 1 Each |
| 3 Cartridge Pack – contains 1 x Triple Filter and 2 x Combi Filter (Moisture, Hydrocarbons) | Yes | 60180-828 | 1 Each |
| High Flow Pack of 2 x Hydrocarbon Filters for LC-MS – no Indicator | No | 60180-839 | 1 Each |
| High Flow Pack of 2 x Moisture Filters for LC-MS – with Indicator | No | 60180-841 | 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 | $N_2$ in LC/MS, $H_2O$ in $H_2$/air generators | Carrier, Make Up and Fuel |

**Super clean cartridge filter baseplates**

| Type | Cat. No. | Quantity |
|---|---|---|
| Single Base | 60180-814 | 1 Each |
| Dual Base | 60180-815 | 1 Each |
| Triple Base | 60180-817 | 1 Each |
| Four-position Base | 60180-818 | 1 Each |
| O-rings for Base Plates | 60180-837 | 20 Pack |
| Flush Cap | 60180-838 | 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 Thermo Scientific™ eVol™ 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 | 66002-020 | 1 Each |
| eVol XCHANGE Syringe 5µL | 66002-021 | 1 Each |
| eVol XCHANGE Syringe 50µL | 66002-022 | 1 Each |
| eVol XCHANGE Syringe 100µL | 66002-038 | 1 Each |
| eVol XCHANGE Syringe 500µL | 66002-023 | 1 Each |
| eVol XCHANGE Syringe 1000µL | 66002-039 | 1 Each |
| Sample Dispensing System Kit* | 66002-024 | 1 Each |
| eVol Stand | 66002-025 | 1 Each |
| Charger for eVol System | 66002-026 | 1 Each |
| Charging Stand for eVol System | 66002-027 | 1 Each |
| Replacement Battery for eVol System | 66002-028 | 1 Each |
| Replacement Plunger for 5µL eVol Syringe | 66002-029 | 1 Each |
| Replacement Plunger for 500µL eVol Syringe | 66002-031 | 1 Each |
| Replacement Plunger for 1000µL eVol Syringe | 66002-041 | 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

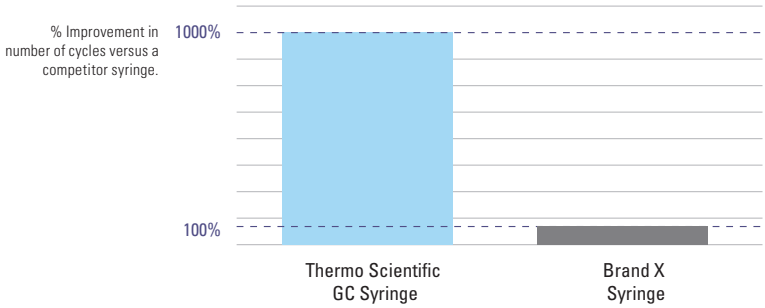
## Providing durability, clarity and accuracy for your sample

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.

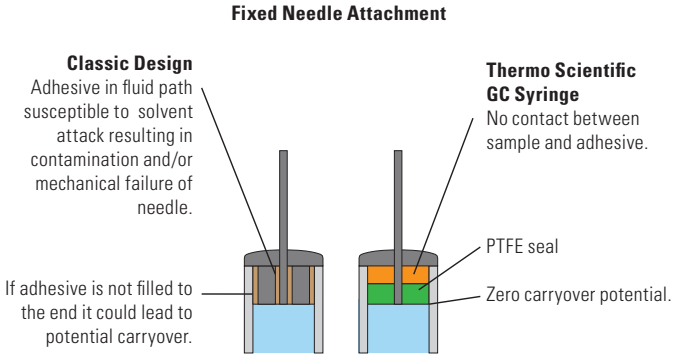



### Accuracy in your GC syringe

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 | 365A0241* | 1 Each | 365RN617 | 1 Each |
| 1 | 57 | 23 | Cone | Split | 365B0251* | 1 Each | 365RN656 | 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 | 365C0221 | 1 Each |
| | 57 | 23s | Cone | SSL, PTV and Merlin Adapter | 365C0231* | 1 Each |
| | 85 | 26s | Cone | Splitless and OC | 365C0241 | 1 Each |
| | 57 | 26s | Cone | SSL and PTV | 365C0251* | 1 Each |
| 10 | 85 | 23s | Cone | Merlin Valve SSL Injector: Splitless | 365D0261 | 1 Each |
| | 57 | 23s | Cone | SSL, PTV and Merlin Adapter | 365D0271* | 1 Each |
| | 85 | 26s | Cone | Splitless and OC | 365D0281 | 1 Each |
| | 57 | 26s | Cone | SSL and PTV | 365D0291* | 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 | 365D0301 | 1 Each |
| | 57 | 23s | Cone | SSL, PTV and Merlin Adapter, especially suitable for volatile solvents or corrosive samples | 365D0311* | 1 Each |
| | 85 | 26s | Cone | Splitless and OC | 365D0321 | 1 Each |
| | 57 | 26s | Cone | SSL, PTV and Merlin Adapter, especially suitable for volatile solvents or corrosive samples | 365D0331* | 1 Each |
| 25 | 57 | 23s | Cone | SSL, PTV and Merlin Adapter | 365F2441* | 1 Each |
| | 85 | 26s | Cone | Splitless and OC | 365F2451 | 1 Each |
| | 57 | 26s | Cone | SSL and PTV | 365F2461* | 1 Each |
| 50 | 57 | 23s | Cone | Large Volume Injection, SSL | 365G2311* | 1 Each |
| | 85 | 26s | Cone | LV OC | 365G2321 | 1 Each |
| 100 | 57 | 23s | Cone | Large Volume Injection, SSL | 365H2141* | 1 Each |
| | 85 | 26s | Cone | LV OC | 365H2151 | 1 Each |
| | 57 | 26s | Cone | Large Volume Injection, SSL w/o Merlin Adapter | 365H2161* | 1 Each |
| | 85 | 23 | Side Hole | Variable depth LV PTV (w & w/o Merlin) | 365H2171 | 1 Each |
| | 57 | 23 | Side Hole | Large Volume Injection, PTV | 365H2181* | 1 Each |
| 250 | 85 | 26 | Cone | LV OC | 365I2321 | 1 Each |
| | 57 | 26 | Cone | LV Splitless | 365I2331 | 1 Each |
| | 85 | 23 | Side Hole | Variable depth LV PTV (w & w/o Merlin) | 365I2341 | 1 Each |
| | 57 | 23 | Side Hole | LV PTV (with or without Merlin valve) | 365I2351 | 1 Each |
| 500 | 85 | 26 | Cone | LV OC | 365J2411 | 1 Each |
| | 57 | 26 | Cone | Sample Preparation, i.e. dilution, derivatization | 365J2421 | 1 Each |
| | 57 | 23 | Side Hole | LV PTV (with or without Merlin valve) | 365J2441 | 1 Each |
| 1000 | 65 | 23 | Side Hole | Headspace, up to 115 deg. | 365Q2121 | 1 Each |
| | 57 | 22 | LC | Sample Preparation, i.e. dilution, derivatization | 365K2811 | 1 Each |
| 2500 | 65 | 23 | Side Hole | Headspace, up to 115 deg. | 365Q2131 | 1 Each |
| | 65 | 23 | Side Hole | Headspace, up to 150 deg. | 365L2321 | 1 Each |
| 5000 | 65 | 22 | Side Hole | Headspace up to 115 deg. | 365Q2141 | 1 Each |
| 10000 | 57 | 19 | LC | Sample Preparation, i.e. dilution, derivatization | 365N2721 | 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 | 36500520 | 1 Each | 36550046 | 2 Pack | |
| 100 | 50 | 23 | Side hole | See Note | 36520050 | 1 Each | 36550040 | 2 Pack | TriPlus, AS200/AS800 |
| 100 | 50 | 23 | Cone | LV Splitless | 36500495 | 1 Each | 36566485 | 5 Pack | TriPlus, AS2000, AS200/AS800 |
| 250 | 80 | 26 | Cone | LVOC | 36500490 | 1 Each | 36566480 | 5 Pack | TriPlus, AS2000 |
| 250 | 50 | 23 | Side hole | See Note | 36520051 | 1 Each | 36550040 | 2 Pack | TriPlus, AS2000, AS200/AS800 |
| 1000 | 50 | 23 | Bevel | | 365K3041 | 1 Each | 365RN235 | 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 | 36500510 | 1 Each | 36550045 | 2 Pack | |
| 10 | 50 | 26 | Cone | | 365D1841 | 1 Each | 365RN362 | 2 Pack | AS3000, AS2000 |
| 10 | 50 | 23 | Cone | | 365D3731 | 1 Each | 365RN372 | 2 Pack | AS3000, AS2000, AS200/AS800 |
| 50 | 50 | 23 | Cone | LV Splitless | 36503015 | 1 Each | 36566485 | 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 | | 365D3741 | 1 Each | AS2000 |
| 100 | 50 | 25 | Bevel | | 365H2321 | 1 Each | AS200/AS800 |
| 250 | 50 | 25 | Bevel | | 365I2561 | 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 | 36504047 | 1 Each | TriPlus |
| 5 | 50 | 23 | Cone | | 365C3701 | 1 Each | AS3000, AS2000, AS200/AS800 AI/AS1310 |
| 5 | 50 | 26 | Cone | Split/PTV | 36500505 | 1 Each | AS3000, AS2000 AI/AS1310 |
| 5 | 80 | 26 | Cone | Splitless and OC | 36502025 | 1 Each | TriPlus |
| 10 | 50 | 26 | Cone | | 365D3711 | 1 Each | AS3000, AS200, AS200/AS800 |
| 10 | 50 | 26 | Cone | | 365D1856 | 6 Pack | AS300, AS2000, AS200/AS800 |
| 10 | 50 | 25 | Cone | Split/PTV | 36500525 | 1 Each | TriPlus, AS3000, AS2000, AS200/ AS800, AI/AS1310 |

### Fixed needle syringes (Continued)

| Volume (µL) | Length (mm) | Gauge | Tip Style | Type | Cat No. | Quantity | Instrument Compatibility |
|---|---|---|---|---|---|---|---|
| 10 | 50 | 23 | Cone | PTV/SSL Split | 36520060 | 1 Each | AI/AS1310, TriPlus, AS300, AS2000, AS200/AS800 |
| 10 | 80 | 23 | Cone | Merlin Valve SSL Splitless | 36520061 | 1 Each | TriPlus, AS2000 |
| 10 | 50 | 23-26 | Cone | OC in PTV Merlin Valve | 36500580 | 1 Each | TriPlus, AS2000 |
| 10 | 80 | 26 | Cone | OC and Splitless | 36502019 | 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 | 36504045 | 1 Each | AI/AS1310, TriPlus, AS3000 |
| 0.5 | 75 | 31 | Cone | Manual OC | 36500500 | 1 Each | |
| 0.5 | 80 | 26 | Cone | Splitless and OC | 36504046 | 1 Each | TriPlus |

## GC syringes for Agilent instruments

### Removable needle syringes

| Volume (µL) | Length (mm) | Gauge | Tip Style | Cat. No. | Quantity |
|---|---|---|---|---|---|
| 10 | 42 | 23 | Cone | 365D1611 | 6 Pack |

### Fixed needle, gas tight syringes

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

### Fixed needle syringes

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

### Fixed needle, super-elastic plunger syringes

| Volume (µL) | Length (mm) | Gauge | Tip Style | Cat. No. | Quantity |
|---|---|---|---|---|---|
| 10 | 42 | 23-26s | Cone | 365D5416 | 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 | 365C6610 | 1 Each | | |
| | | 23s | Cone | | | 365RN661 | 2 Pack |
| | 42 | 26s | Cone | 365D6610 | 1 Each | 365RN272 | 2 Pack |
| | | 23s | Cone | 365D6620 | 1 Each | | |

## 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 | 365D3731 | 1 Each | 365RN372 | 2 Pack |
| | | 26 | Cone | 365D1841 | 1 Each | 365RN362 | 2 Pack |

### Fixed needle, gas tight syringes

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

### Fixed needle syringes

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

Learn more at **thermofisher.com/GCparts**

# Manual GC syringes

### Removable needle, gas tight syringes

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

### Removable needle syringes

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

### Fixed needle, gas tight syringes

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

### Fixed needle syringes

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

### PTFE Luer-Lok, gas tight syringes

| *Volume (µL)* | *Cat. No.* | *Quantity* | *Needle Cat. No.* | *Quantity* |
|---|---|---|---|---|
| 25 | 365F7655 | 1 Each | 365RNL22 | 2 Pack |
| 50 | 365G7656 | 1 Each | 365RNL22 | 2 Pack |
| 100 | 365H7657 | 1 Each | 365RNL22 | 2 Pack |
| 250 | 365I7658 | 1 Each | 365RNL22 | 2 Pack |
| 500 | 365J7659 | 1 Each | 365RNL22 | 2 Pack |
| 1000 | 365KL531 | 1 Each | 365RNL22 | 2 Pack |
| 2500 | 365LL541 | 1 Each | 365RNL22 | 2 Pack |
| 5000 | 365ML551 | 1 Each | 365RNL22 | 2 Pack |
| 10000 | 365NL561 | 1 Each | 365RNL22 | 2 Pack |
| 25000 | 365PL571 | 1 Each | 365RNL22 | 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** |
|---|---|---|
| 100 | 365H7814 | 1 Each |
| 1000 | 365K7817 | 1 Each |
| 2500 | 365L7818 | 1 Each |
| 5000 | 365M7819 | 1 Each |
| 10000 | 365N7820 | 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

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

**TR-Green septa**
- Long injection lifetime
- Low injection port adhesion
- 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 | – | 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 |

Learn more at **thermofisher.com/GCparts**



# 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 | 290GA081 | 10 Pack |
| Single Column Installation | 0.8 | 290GA082 | 2 Pack |
| Single Column Installation (Cross Version) | 0.8 | 290GA084 | 10 Pack |
| Single Column Installation (Cross Version) | 0.8 | 290GA083 | 2 Pack |
| Dual Column Installation | 1.2 | 290GA121 | 10 Pack |
| Dual Column Installation | 1.2 | 290GA122 | 2 Pack |

### Siltek inlet base seals

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

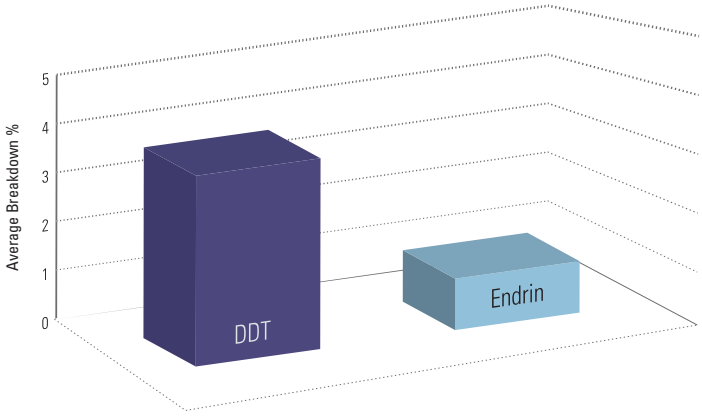



**Figure 1**: Endrin and DDT breakdown test results showing the lot-to-lot reproducibility and low levels of inertness of LinerGOLD

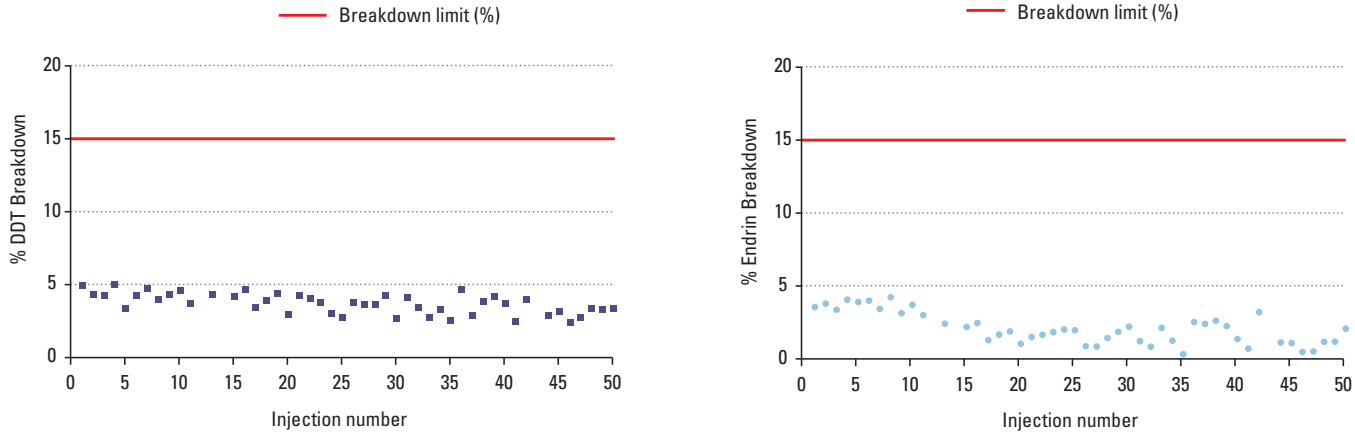



**Figure 2:** Compound degradation after 50 injections – LinerGOLD exhibits minimal breakdown

Learn more at **thermofisher.com/GCparts**

### LinerGOLD GC liners for Thermo Scientific TRACE 1300 series and Agilent instruments, SSL injector

| Injection Type | ID x OD (mm) | Length (mm) | Packing | Cat. No. 5 Pack | Cat. No. 25 Pack |
|---|---|---|---|---|---|
| Split/Splitless Liner | 4 x 6.3 | 78.5 | Quartz Wool | 453A2265-UI | 453A1262-UI |
| Split/Splitless Straight Liner | 4 x 6.3 | 78.5 | No | 453A1295-UI | 453A2292-UI |
| Splitless/Split Liner with Single Taper | 4 x 6.3 | 78.5 | No | 453A1345-UI | 453A2342-UI |
| Splitless/Split Liner with Single Taper | 4 x 6.3 | 78.5 | Quartz Wool | 453A1925-UI | 453A2922-UI |
| Splitless Liner with Double Taper | 4 x 6.3 | 78.5 | No | 453A1355-UI | 453A2352-UI |
| Precision Split/Splitless Liner | 4 x 6.3 | 78.5 | Quartz Wool | 453A1255-UI | 453A1252-UI |
| Direct Straight Liner | 1 x 6.3 | 78.5 | No | 453A1335-UI | 453A2332-UI |
| LinerGOLD Mixed Liner Pack | 1 x 6.3 | Mixed | Mixed | 453TH002-UI | N/A |

### LinerGOLD GC liners for Thermo Scientific TRACE Ultra and FOCUS instruments

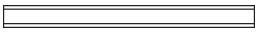
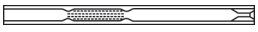
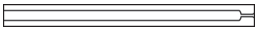
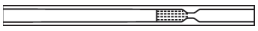
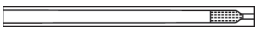
| Injection Type | ID x OD (mm) | Length (mm) | Packing | Cat. No. 5 Pack | Cat. No. 25 Pack |
|---|---|---|---|---|---|
| Direct Straight Liner | 5 x 8 | 105 | No | 45350030-UI | 45354030-UI |
| Split Straight Liner | 3 x 8 | 105 | No | 45350031-UI | 45354031-UI |
| Splitless Liner | 3 x 8 | 105 | No | 45350032-UI | 45354032-UI |
| Splitless Liner | 5 x 8 | 105 | No | 45350033-UI | 45354033-UI |
| Precision Liner | 5 x 8 | 105 | Quartz Wool | 453T1905-UI | 453T4905-UI |
| Splitless Precision Liner | 5 x 8 | 105 | Quartz Wool | 453T2999-UI | 453T4999-UI |
| Baffled PTV Liner | 2 x 2.75 | 120 | No | 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 and Agilent instruments, SSL injector

| | 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 | 453A1335 | 453A2332 |
|  | Split Straight Liner | 4 x 6.3 | 78.5 | Quartz Wool | 453A2265 | 453A1262 |
|  | Split Straight Liner | 4 x 6.3 | 78.5 | No | 453A1295 | 453A2292 |
|  | Split/Splitless FocusLiner | 4 x 6.3 | 78.5 | Quartz Wool | 453A1255 | 453A1252 |
|  | Split/Splitless FocusLiner with Single Taper | 4 x 6.3 | 78.5 | Quartz Wool | 453A1315 | 453A1312 |
|  | Split/Splitless Liner with Single Taper | 4 x 6.3 | 78.5 | No | 453A1345 | 453A2342 |
|  | Split/Splitless Liner with Double Taper | 4 x 6.3 | 78.5 | No | 453A1355 | 453A2352 |
|  | Split/Splitless Liner w/ Recessed Gooseneck | 4 x 6.3 | 78.5 | Quartz Wool | 453A1305 | N/A |
|  | Splitless Liner with Single Taper | 4 x 6.3 | 78.5 | Quartz Wool | 453A1925 | N/A |
| | Split/Splitless Mini-Lam Liner | 4 x 6.3 | 78.5 | No | 453A2009 | N/A |
| | Split/Splitless Mixed Liner Sample Pack | Mixed | Mixed | Mixed | 453TH002 | N/A |

### Liners for Thermo Scientific TRACE 1300 series and TRACE ULTRA PTV instruments, PTV injector

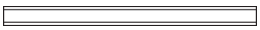
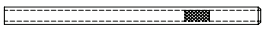
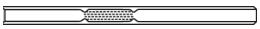
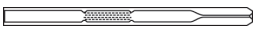
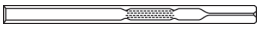
| | Injection Type | ID x OD (mm) | Length (mm) | Packing | Cat. No. 2 Pack | Cat. No. 5 Pack | Cat. No. 25 Pack |
|---|---|---|---|---|---|---|---|
|  | PTV Straight Liner | 1 x 2.75 | 120 | No | N/A | 45352054 | N/A |
|  | PTV Straight Liner | 2 x 2.75 | 120 | No | N/A | 45352057 | 45354057 |
| | PTV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

Learn more at **thermofisher.com/GCparts**

### Liner sealing rings for Thermo Scientific instruments

| Description | Cat. No. | Quantity |
|---|---|---|
| Liner Sealing Ring for TRACE 1300 Series GC SSL Injector | 29001320 | 5 Each |
| Liner Sealing Ring for TRACE 1300 Series GC PTV Injector | 29001318 | 1 Each |
| Liner sealing Ring for TRACE and FOCUS GC SSL Injector | 29033406 | 10 Pack |
| Liner sealing Ring for TRACE PTV Injector | 29013417 | 2 Pack |

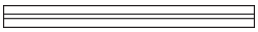
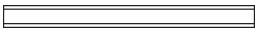
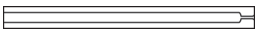
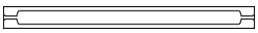
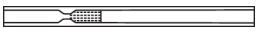
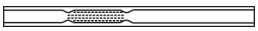
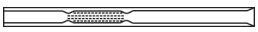
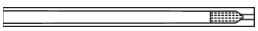
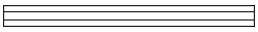
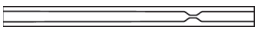
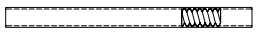
### Liners for Thermo Scientific TRACE ULTRA and FOCUS SSL instruments, SSL injector

| | 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 | 45350030 | 45354030 |
|  | Split Straight Liner | 3 x 8 | 105 | No | 45350031 | 45354031 |
|  | Split Straight Liner | 5 x 8 | 105 | CarboFrit | 453T2131 | N/A |
|  | Splitless Straight Liner | 3 x 8 | 105 | No | 45350032 | 45354032 |
|  | Splitless Straight Liner | 5 x 8 | 105 | No | 45350033 | 45354033 |
|  | Splitless Straight Liner | 5 x 8 | 105 | CarboFrit | 453T2130 | N/A |
|  | Splitless Straight Liner (Siltek) | 3 x 8 | 105 | No | 453T2121 | N/A |
|  | Split FocusLiner for 50mm Needle | 5 x 8 | 105 | Quartz Wool | 453T1905 | 453T4905 |
|  | Splitless FocusLiner for 50mm Needle | 5 x 8 | 105 | Quartz Wool | 453T2999 | 453T4999 |
|  | Splitless FocusLiner for 70mm Needle | 5 x 8 | 105 | Quartz Wool | 453T2895 | 453T4895 |
|  | Split/Splitless Straight Liner | 0.75 x 2.75 | 105 | No | 45352083 | N/A |



# Injection port liners for Agilent instruments

### Liners for Agilent instruments

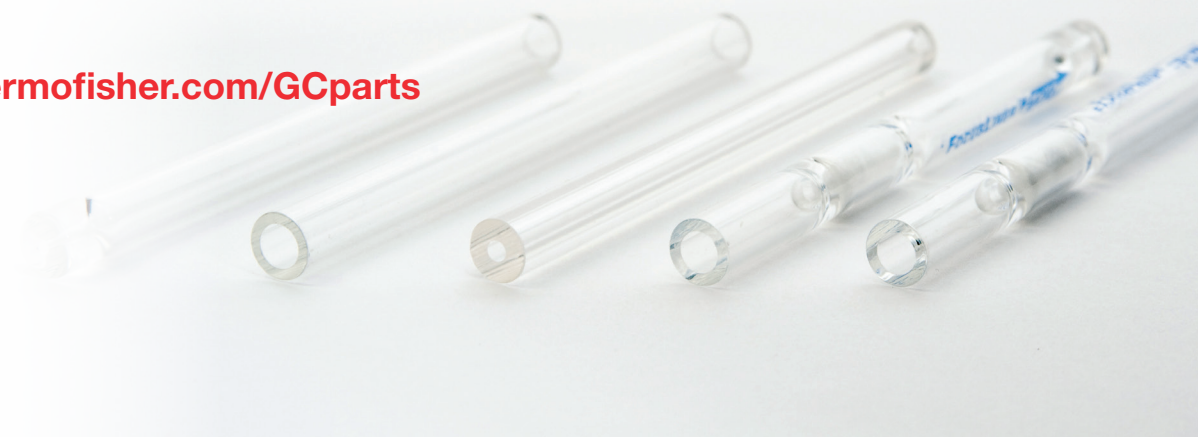
| | Injection Type | ID x OD (mm) | Length (mm) | Packing | Cat. No. 5 Pack | Cat No. 25 Pack |
|---|---|---|---|---|---|---|
|  | Direct Straight Liner | 1.2 x 6.3 | 78.5 | No | 453A1335 | 453A2332 |
|  | Split Straight Liner | 4 x 6.3 | 78.5 | Quartz Wool | 453A2265 | 453A1262 |
|  | Split Straight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

### Liner sealing rings for Agilent instrument

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

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

Learn more at **thermofisher.com/GCparts**



# 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 (SilTite) | 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.



### SilTite Metal Ferrules

The SilTite 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, SilTite Ferrules do not need re-tightening after installation.

Please also see syringes on page 5-008.

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 | SilTite |
|---|---|---|---|
| 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 | 290GA139 | 10 Pack |
| | | 0.45-0.53 | 290GA140 | 10 Pack |
| | 15% Graphite/85% Vespel | 0.1-0.25 | 290VA191 | 10 Pack |
| | | 0.32 | 290VA192 | 10 Pack |
| | | 0.53 | 290VA193 | 10 Pack |
| Capillary Column Nut for injectors and non-MS Detectors | Stainless Steel | | 35050458 | 5 Pack |
| Thermo Scientific TRACE Ultra SSL injectors and non-MS detectors | 100 % Graphite | 0.1-0.25 | 29053488 | 10 Pack |
| | | 0.32 | 29053487 | 10 Pack |
| | | 0.53 | 29053486 | 10 Pack |
| | 15% Graphite/85% Vespel | 0.1-0.25 | 29033461 | 10 Pack |
| | | 0.32 | 29033460 | 10 Pack |
| | | 0.53 | 29033471 | 10 Pack |
| | | Packed Column 1/8" OD | 290VT168 | 10 Pack |
| | | Packed Column 1/4" OD | 290VT165 | 10 Pack |
| | 15% Graphite/85% Vespel (3.4mm length) | 0.1-0.25 | 290VT186 | 10 Pack* |
| | | 0.32 | 290VT187 | 10 Pack* |
| | | 0.53 | 290VT188 | 10 Pack* |
| Capillary Column Nut for Graphite/Vespel Ferrules | Brass | | 290BT239 | 2 Pack |
| All Thermo Scientific PTV injectors | 100 % Graphite | 0.1-0.25 | 29053488 | 10 Pack |
| | | 0.32 | 29053487 | 10 Pack |
| | | 0.53 | 29053486 | 10 Pack |
| Thermo Scientific MS detectors | 15% Graphite/85% Vespel | 0.1-0.25 | 29033496 | 10 Pack |
| | | 0.32 | 29033497 | 10 Pack |
| Capillary Column Nut for MS Detector | Brass | | 290BT240 | 5 Pack |
| | Stainless Steel | | 290BT241 | 5 Pack |
| Thermo Scientific MS detectors | VESPEL SCP-5000 | 0.1-0.25 | 290VT221 | 5 Pack |
| Capillary Column Spring Loaded Nut for MS Detectors | Stainless Steel for ISQ/TSQ | | 1R120434-0010 | 1 Pack |
| | Stainless Steel for QE GC/Exactive GC | | 1R120434-0020 | 1 Pack |
| SilTite Kit for Thermo Scientific TRACE 1300/1310 GC SSL injectors | SilTite Metal | 0.1-0.25 | 290MA215 | 1 Each** |
| | | 0.32 | 290MA216 | 1 Each** |
| | | 0.53 | 290MA217 | 1 Each** |
| SilTite Kit for Thermo Scientific ISQ GC-MS interface | SilTite Metal | 0.1-0.25 | 290MA194 | 1 Each** |
| | | 0.32 | 290MA195 | 1 Each** |
| | | 0.53 | 290MA196 | 1 Each** |
| Replacement SilTite Ferrules for Thermo Scientific TRACE 1300/1310 SSL and ISQ GC-MS interface kits | SilTite Metal | 0.1-0.25 | 290MA201 | 10 Pack |
| | | 0.32 | 290MA202 | 10 Pack |
| | | 0.53 | 290MA203 | 10 Pack |
| SilTite Nuts for MS interface | | | 290MA205 | 5 Pack |
| SilTite Nuts for SSL injectors | | | 290MA207 | 5 Pack |
| SilTite Kits for Thermo Scientific DSQ GC-MS interface | SilTite Metal | 0.1-0.25 | 290MT229 | 1 Each** |
| | | 0.32 | 290MT230 | 1 Each** |
| | | 0.53 | 290MT231 | 1 Each** |
| | | Replacement SilTite Nuts | 290MT211 | 5 Pack |
| Replacement SilTite Ferrules for Thermo Scientific DSQ GC-MS interface kits | SilTite Metal | 0.1-0.25 | 290MT221 | 10 Pack |
| | | 0.32 | 290MT222 | 10 Pack |
| | | 0.53 | 290MT223 | 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 | 290GA139 | 10 Pack |
| | | 0.45-0.53 | 290GA140 | 10 Pack |
| | | Packed Column 1/8" OD | 290GA108 | 10 Pack |
| | | Packed Column 1/4" OD | 290GA107 | 10 Pack |
| | 15% Graphite/85% Vespel | 0.1-0.25 | 290VA191 | 10 Pack |
| | | 0.32 | 290VA192 | 10 Pack |
| | | 0.53 | 290VA193 | 10 Pack |
| | | Packed Column 1/8" OD | 290VT168 | 10 Pack |
| | | Packed Column 1/4" OD | 290VT165 | 10 Pack |
| Capillary Column Nut for injectors and non-MS Detectors | Stainless Steel | | 35050458 | 5 Pack |
| Agilent MS detectors | 15% Graphite/85% Vespel | 0.1-0.25 | 29033496 | 10 Pack |
| | | 0.32 | 29033497 | 10 Pack |
| | | 0.53 | 290VP144 | 10 Pack |
| SilTite Kits for Agilent SSL injectors | SilTite Metal | 0.1-0.25 | 290MA215 | 1 Each* |
| | | 0.32 | 290MA216 | 1 Each* |
| | | 0.53 | 290MA217 | 1 Each* |
| SilTite Nuts for MS interface | | | 290MA205 | 5 Pack |
| SilTite Kit for Agilent MS detectors | SilTite Metal | 0.1-0.25 | 290MA194 | 1 Each** |
| | | 0.32 | 290MA195 | 1 Each** |
| | | 0.53 | 290MA196 | 1 Each** |
| Replacement SilTite Ferrules for all SilTite Kits | SilTite Metal | 0.1-0.25 | 290MA201 | 10 Pack |
| | | 0.32 | 290MA202 | 10 Pack |
| | | 0.53 | 290MA203 | 10 Pack |
| SilTite Nuts for SSL injectors | | | 290MA207 | 5 Pack |
| Replacement Baseplate Seals | | | 290MA227 | 2 Pack |
| | | | 290MA228 | 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 µ-Union

The tiny connection for GC Columns

The SilTite µ-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 µ-Union kit contains the following:

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

**SilTite µ-Union kits, ferrules and replacement unions**

| Column ID (mm) | 2nd Column ID (mm) | SilTite µ-Union Kit Cat. No. (1 Each) | SilTite µ-Union Ferrules Cat. No. (10 Pack) | SilTite µ-Union Replacement Union Cat. No. (1 Each) |
|---|---|---|---|---|
| 0.1 – 0.25 | 0.1-0.25 | 290SM301 | 290SM401 | 290SM321 |
| | 0.32 | 290SM302 | 290SM402 | 290SM321 |
| | 0.53 | 290SM303 | 290SM403 | 290SM322 |
| 0.32 | 0.32 | 290SM304 | 290SM404 | 290SM321 |
| | 0.53 | 290SM305 | 290SM405 | 290SM322 |

## 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 | 290MU498 | 290MF229 | 290MN211 |
| 0.32 | 0.32-0.53 | 290MU499 | 290MF230 | 290MN211 |
| 0.53 | 0.45-0.53 | 290MU500 | 290MF231 | 290MN211 |

* SilTite nuts must be used with SilTite ferrules

**GC capillary connectors**

| Description | Cat. No. | Quantity |
|---|---|---|
| Universal Capillary Connector | 64000-001 | 1 Each |
| Y Capillary Connector | 64000-002 | 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 fittin
- 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 |
|---|---|---|
| Split/Splitless and MS Starter Kit | 290SA131 | 1 Each |
| Split/Splitless and FID Starter Kit | 290SA132 | 1 Each |
| Split/Splitless Injector Base Seal | 290SA133 | 2 Pack |
| Ferrules for 0.1-0.25mm ID Columns | 290S1132 | 10 Pack |
| Ferrules for 0.32mm ID Columns | 290S1131 | 10 Pack |

**Finger tite connectors for TRACE GC Ultra and FOCUS GCs**

| Description | Cat. No. | Quantity |
|---|---|---|
| Female Nut | 290ST130 | 5 Pack |
| Split/Splitless and MS Starter Kit | 290ST131 | 1 Each |
| Split/Splitless and FID Starter Kit | 290ST132 | 1 Each |
| Ferrules for 0.1-0.25mm ID Columns | 290S1132 | 10 Pack |
| Ferrules for 0.32mm ID Columns | 290S1131 | 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 | 260RG497 | 1 Each | 290GU498 | 1 Each |
| Retention Gap Kit, 0.53mm ID, 2m | 260RG499 | 1 Each | 290GU499 | 1 Each |
| Retention Gap Kit, 0.53mm ID, 5m | 260RG500 | 1 Each | 290GU499 | 1 Each |

**Deactivated silica tubing**

| Description | Cat. No. | Quantity |
|---|---|---|
| Deactivated silica tubing, 0.32mm ID; 2m Length | 260G498P | 1 Each |
| Deactivated silica tubing, 0.53mm ID; 2m Length | 260G499P | 1 Each |
| Deactivated silica tubing, 0.25mm ID; 5m Length | 260G495P | 1 Each |
| Deactivated silica tubing, 0.32mm ID; 5m Length | 260G496P | 1 Each |
| Deactivated silica tubing, 0.53mm ID; 5m Length | 260G500P | 1 Each |
| Deactivated silica tubing, 0.53mm ID; 1m Length (Siltek) | 260G401P | 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 Thermo Scientific™ GuardGOLD™ and HydroGOLD columns**

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

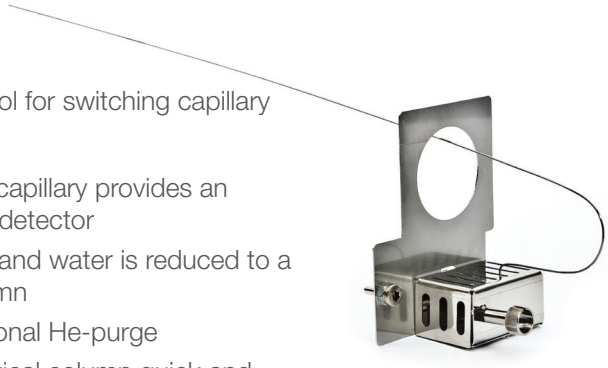
| Description | Cat No. | Quantity |
|---|---|---|
| Capillary Column End Caps, Paired | 260EC111 | 10 Pack |

Learn more at **thermofisher.com/GCparts**

# SWAP-IT GC-MS interface system

Easy to install for quick column changeovers

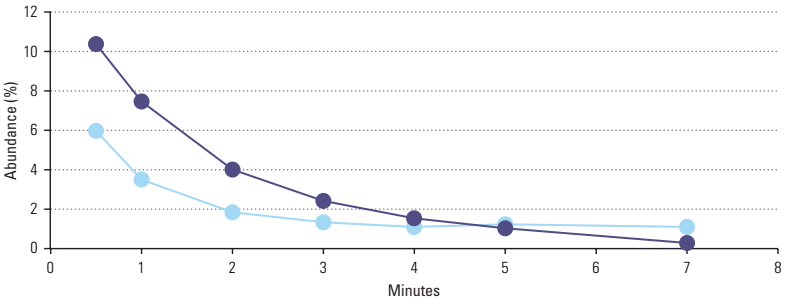
The SWAP-IT GC-MS Interface provides a powerful tool for switching capillary columns without the need to vent the MS



- 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 |
|---|---|---|
| **For Thermo Scientific Instruments (ISQ GC-MS, TSQ 8000 GC-MS/MS)** | | |
| SWAP-IT GC-MS Interface Kit: SWAP-IT GC-MS Interface, Nuts, Ferrules, Accessories | 60180-791 | 1 Each |
| **For Thermo Scientific Instruments (DSQ GC-MS, DSQ II GC-MS, PolarisQ GC-MS, ITQ GC-MS only)** | | |
| SWAP-IT GC-MS Interface Kit: SWAP-IT GC-MS Interface, Nuts, Ferrules, Accessories | 60180-790 | 1 Each |
| SWAP-IT GC-MS Interface, SWAP-IT only | 60180-792 | 1 Each |
| Transfer Line Nut | 290SG001 | 1 Each |
| Graphite/Vespel Ferrule for Transfer Line | 290SG020 | 10 Pack |
| **For Agilent Instruments** | | |
| SWAP-IT GC-MS Interface Kit: SWAP-IT GC-MS Interface, Nuts, Ferrules, Accessories | 60180-794 | 1 Each |
| SWAP-IT GC-MS Interface, SWAP-IT Only | 60180-796 | 1 Each |
| Transfer Line Nut | 290SG004 | 1 Each |
| Graphite/Vespel Ferrule for Transfer Line | 290SG021 | 10 Pack |
| SWAP-Tight Nut and Adaptor for S/SL Injector | 290SG003 | 1 Each |
| **Accessories** | | |
| SWAP-Tight Nut | 290SG002 | 1 Each |
| SWAP-Tight Ferrules, Blank | 290SG000 | 10 Pack |
| SWAP-Tight Ferrules, 0.1 – 0.25mm | 290SG025 | 10 Pack |
| SWAP-Tight Ferrules, 0.32mm | 290SG032 | 10 Pack |

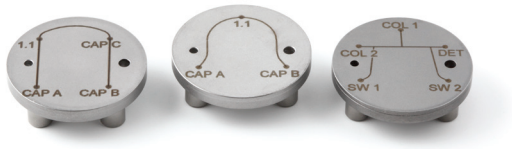



Removal of water and nitrogen to levels less than 2% is obtained within 3-4 minutes after column replacement

## 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) | 60201-398 | 1 Each |

### 3-Port SilFlow repacement parts

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

## GC tubing

GC tubing for plumbing GC systems

### GC tubing

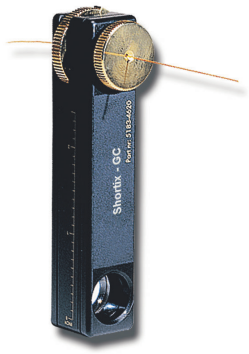
| Material | OD (in) | ID (in) | Length (ft) | Cat. No. | Quantity |
|---|---|---|---|---|---|
| Copper | 1/8 | 0.065 | 50 | 60181-632 | 1 Each |
| | 1/4 | 0.19 | 50 | 60181-633 | 1 Each |
| Stainless Steel | 1/16 | 0.01 | 25 | 60181-634 | 1 Each |
| | | 0.02 | 25 | 60181-635 | 1 Each |
| | | 0.03 |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

# GC tools

## Support GC applications

**GC tools**

| Description | Cat. No. | Quantity |
|---|---|---|
| Straight-Tipped Forceps | 60180-770 | 1 Each |
| Angle-Tipped Forceps | 60180-771 | 1 Each |
| 0.35mm Drill Bit | 60180-779 | 1 Each |
| 0.45mm Drill Bit | 60180-780 | 1 Each |
| 0.70mm Drill Bit | 60180-781 | 1 Each |
| Adjustable Spanner | 60180-782 | 1 Each |
| Shortix Capillary Column Cutter | 60180-835 | 1 Each |
| Shortix Capillary Column Cutter Repair Kit | 60180-836 | 1 Each |
| Ceramic Column Cutter | 60201-318 | 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 | 60180-784 | 1 Each |
| Capillary Tool Kit for Agilent GCs | 60180-786 | 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 | 60180-888 | 1 Each |

# GLD pro gas leak detector

Aids in quickly locating and identifying gas leaks

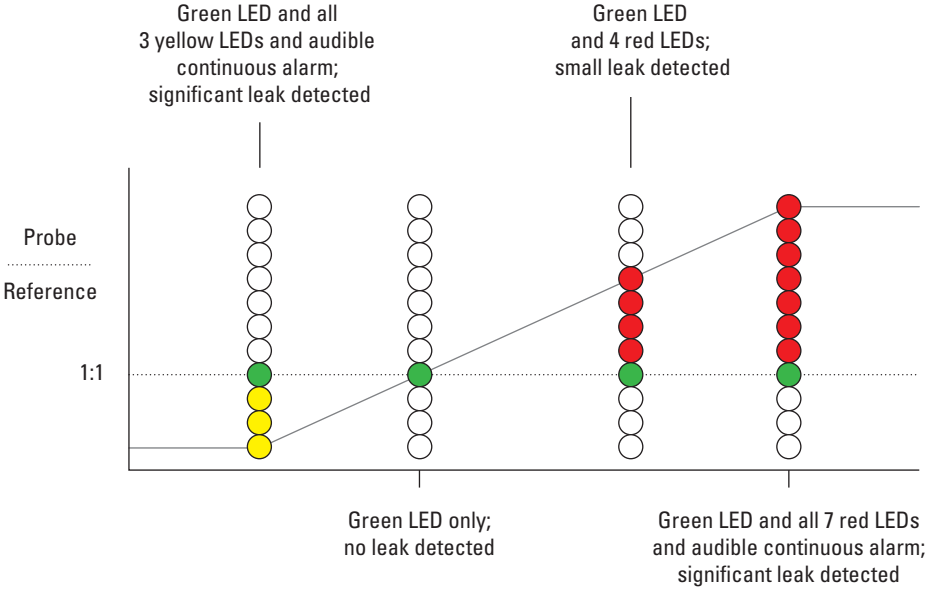
The Thermo Scientific™ GLD Pro Gas Leak Detector is specifically designed for use with gas chromatography instruments. Detection of leaks allows the user to reduce detector noise, provide a stable baseline, reduce carrier gas by minimizing waste, and maximize the lifetime of the analytical column by 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 | 66002-001 | 1 Each |
| Small Probe Adaptor | 66002-003 | 1 Each |
| Soft-Sided Carry Case (Leak Detector not included) | 66002-002 | 1 Each |




Learn more at **thermofisher.com/GCtools**

# GFM pro electronic flowmeter

Measure and monitor flow quickly and efficiently

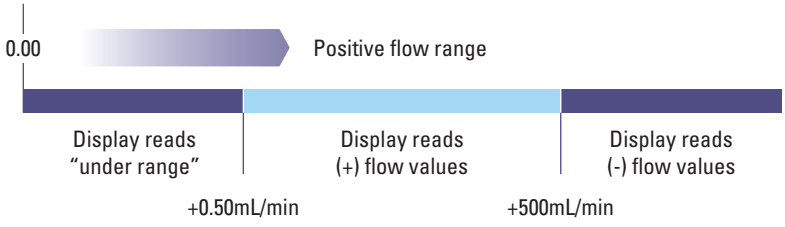
The Thermo Scientific™ GFM Pro Flowmeter is specifically designed for use with gas chromatography instruments. This versatile product is an electronic device capable of measuring volumetric flow for all types of gases. Real-time measurements can be made for various types of flow paths including continually 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 | 66002-010 | 1 Each |
| Soft-Sided Carry Case (Flowmeter not included) | 66002-002 | 1 Each |
| GFM Pro Flowmeter Re-Calibration | 66002-GFMCAL | 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




For more information visit
**thermofisher.com/GCcolumns**

# 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.

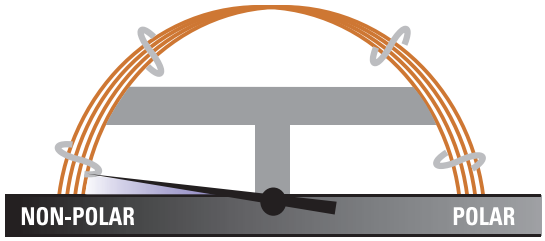

| | | | | | |
|---|---|---|---|---|---|
| TG-1MS | 035 | TG-624SilMS | 045 | TG-XLBMS | 055 |
| TG-5MS | 036 | TG-1701MS | 046 | TG-VRX | 056 |
| TG-5SilMS | 037 | TG-17MS | 047 | TG-VMS | 057 |
| TG-5MS AMINE | 038 | TG-17SilMS | 048 | TG-OCP I / TG OCP II | 058 |
| TG-5HT | 039 | TG-225MS | 049 | TG-OPP I / TG-OPP II | 059 |
| TG-SQC | 040 | TG-200MS | 050 | TG-ALC Plus I / TG-ALC Plus II | 060 |
| TG-35MS | 041 | TG-WaxMS | 051 | TG-Dioxin | 061 |
| TG-35MS AMINE | 042 | TG-WaxMS A | 052 | | |
| TG-1301MS | 043 | TG-WaxMS B | 053 | | |
| TG-624 | 043 | TG-POLAR | 054 | | |




# 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<br>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 | 26099-0200 | 1 Each |
| 0.20 | 12 | 0.33 | 26099-5820 | 1 Each |
| 0.15 | 20 | 0.15 | 26099-2760 | 1 Each |
| | 40 | 0.15 | 26099-2940 | 1 Each |
| 0.18 | 20 | 0.18 | 26099-5780 | 1 Each |
| 0.25 | 15 | 0.25 | 26099-1300 | 1 Each |
| | | 0.5 | 26099-2110 | 1 Each |
| | | 1.0 | 26099-2840 | 1 Each |
| | 30 | 0.25 | 26099-1420 | 1 Each |
| | | 0.5 | 26099-2230 | 1 Each |
| | | 1.0 | 26099-2960 | 1 Each |
| | 30 with 5m SafeGuard | 0.25 | 26099-1425 | 1 Each |
| | 60 | 0.25 | 26099-1540 | 1 Each |
| | | 0.5 | 26099-2350 | 1 Each |
| | | 1.0 | 26099-3080 | 1 Each |
| 0.32 | 15 | 0.25 | 26099-1310 | 1 Each |
| | | 1.0 | 26099-2850 | 1 Each |
| | 30 | 0.25 | 26099-1430 | 1 Each |
| | | 0.5 | 26099-2240 | 1 Each |
| | | 1.0 | 26099-2970 | 1 Each |
| | | 3.0 | 26099-4840 | 1 Each |
| | 60 | 0.25 | 26099-1550 | 1 Each |
| | | 0.5 | 26099-2360 | 1 Each |
| | | 1.0 | 26099-3090 | 1 Each |
| 0.53 | 15 | 0.5 | 26099-2130 | 1 Each |
| | | 1.0 | 26099-2860 | 1 Each |
| | | 1.5 | 26099-3340 | 1 Each |
| | 30 | 0.5 | 26099-2250 | 1 Each |
| | | 1.0 | 26099-2980 | 1 Each |
| | | 1.5 | 26099-3360 | 1 Each |
| | 30 with 5m SafeGuard | 1.0 | 26099-2985 | 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

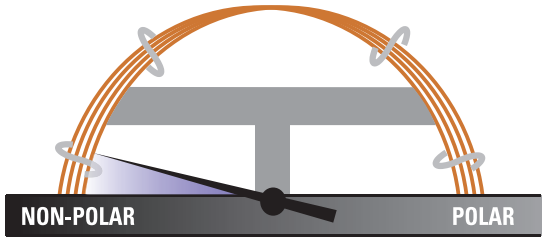
### TraceGOLD TG-1MT Metal GC columns

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

# 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<br>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 | 26098-0200 | 1 Each |
| 0.15 | 20 | 0.15 | 26098-2760 | 1 Each |
| | 40 | 0.15 | 26098-2940 | 1 Each |
| 0.18 | 20 | 0.18 | 26098-5780 | 1 Each |
| | 20 with 5m SafeGuard | 0.18 | 26098-5785 | 1 Each |
| 0.25 | 15 | 0.25 | 26098-1300 | 1 Each |
| | 15 with 5m SafeGuard | 0.25 | 26098-1305 | 1 Each |
| | 30 | 0.25 | 26098-1420 | 1 Each |
| | | 0.5 | 26098-2230 | 1 Each |
| | | 1.0 | 26098-2960 | 1 Each |
| | 30 with 5m SafeGuard | 0.1 | 26098-0475 | 1 Each |
| | | 0.25 | 26098-1425 | 1 Each |
| | 60 | 0.25 | 26098-1540 | 1 Each |
| | | 0.5 | 26098-2350 | 1 Each |
| | | 1.0 | 26098-3080 | 1 Each |
| 0.32 | 15 | 1.0 | 26098-2850 | 1 Each |
| | 30 | 0.25 | 26098-1430 | 1 Each |
| | | 0.5 | 26098-2240 | 1 Each |
| | | 1.0 | 26098-2970 | 1 Each |
| | 30 with 5m SafeGuard | 0.25 | 26098-1435 | 1 Each |
| | 60 | 0.25 | 26098-1550 | 1 Each |
| | | 0.5 | 26098-2360 | 1 Each |
| | | 1.0 | 26098-3090 | 1 Each |
| 0.53 | | 0.5 | 26098-2130 | 1 Each |
| | | 1.0 | 26098-2860 | 1 Each |
| | | 1.5 | 26098-3340 | 1 Each |
| | 30 | 0.25 | 26098-1440 | 1 Each |
| | | 0.5 | 26098-2250 | 1 Each |
| | | 1.0 | 26098-2980 | 1 Each |
| | | 1.5 | 26098-3360 | 1 Each |
| | 60 | 5.0 | 26098-4100 | 1 Each |

**Applications:**

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

**Similar to:**

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

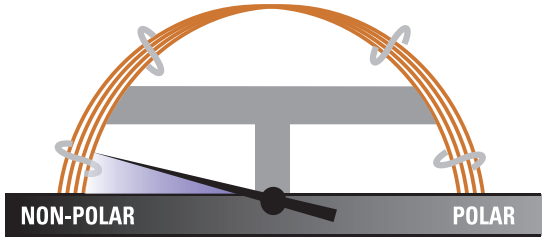
### TraceGOLD TG-5MT Metal GC columns

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.25 | 15 | 0.1 | 26M98-0350 | 1 Each |
| | | 0.25 | 26M98-1300 | 1 Each |
| | 30 | 0.25 | 26M98-1420 | 1 Each |
| | 60 | 0.25 | 26M98-1540 | 1 Each |

# TraceGOLD TG-5SilMS 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




| | |
|---|---|
| Phase: | 5% phenyl / 95% dimethyl arylene polysiloxane |
| Max. Temps.: | 330°C/350°C |
| USP Listing: | G27, G36 |

**TraceGOLD TG-5SilMS GC columns**

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

**Applications:**

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

**Similar to:**

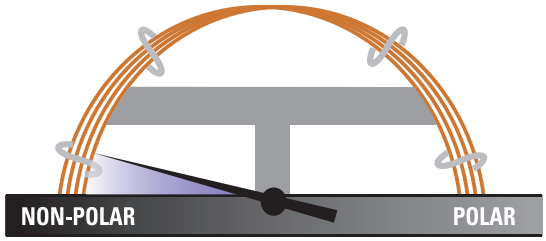
- DB-5ms Ultra Inert
- VF-5ms
- CP-Sil 8 Low-Bleed/MS
- Rxi-5SilMS
- BPX5
- ZB-5ms
- Optima-5MS
- SLB-5

Learn more at **thermofisher.com/GCcolumns**

# 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 | 26097-1300 | 1 Each |
| | | 1.0 | 26097-2840 | 1 Each |
| | 30 | 0.25 | 26097-1420 | 1 Each |
| | | 0.5 | 26097-2230 | 1 Each |
| | | 1.0 | 26097-2960 | 1 Each |
| 0.32 | 30 | 1.0 | 26097-2970 | 1 Each |
| 0.53 | 30 | 1.0 | 26097-2980 | 1 Each |
| | | 3.0 | 26097-3960 | 1 Each |

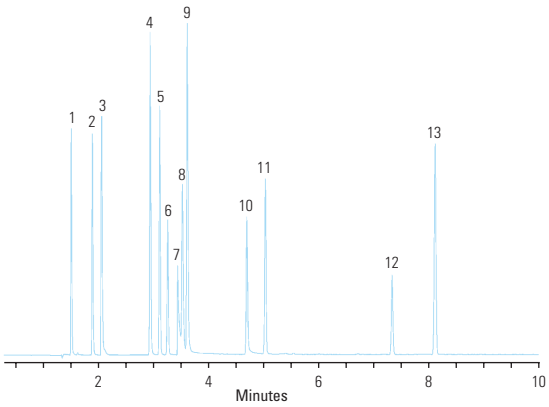
### Applications:

- 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**

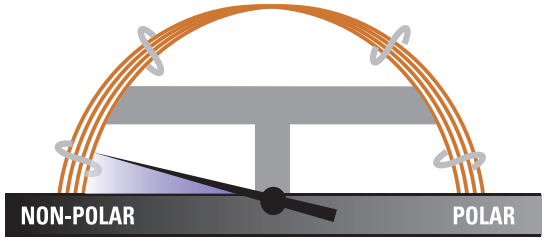
| | |
|---|---|
| Temperature: | 120°C to 220°C at 10°C/minute |
| Detector Type: | FID |
| Carrier Gas: | Hydrogen |
| Flow Rate: | 40cm/min |
| Injection Volume: | 1.0µL |
| Injection Mode: | Split 25:1, 300°C |

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

# 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%




| | |
|---|---|
| Phase: | 5% diphenyl / 95% dimethyl polysiloxane |
| Max. Temps.: | 380°C/400°C |
| USP Listing: | G27, G36 |

**TraceGOLD TG-5HT GC columns**

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

**Applications:**

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

**Similar to:**

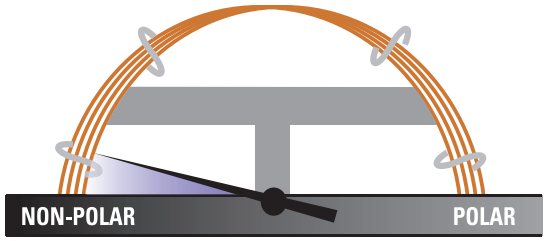
- Rxi-5HT
- BP-5HT
- VF-5HT
- ZB-5HT

Learn more at **thermofisher.com/GCcolumns**

# 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




| | |
|---|---|
| Phase: | Proprietary |
| Max. Temps.: | 330°C/350°C |

**TraceGOLD TG-SQC GC columns**

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

**Applications:**

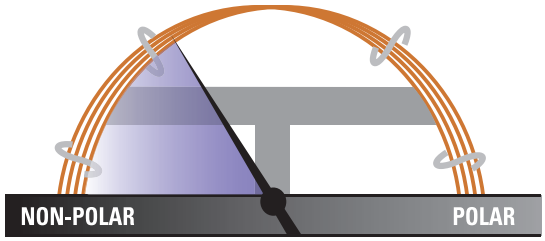
- System Qualification Tests (Thermo Scientific GC-MS)



# TraceGOLD TG-35MS GC columns

Higher phenyl content for useful elution order and retention time changes

- Mid-polarity phase
- Equivalent to USP G42 phase




| | |
|---|---|
| Phase: | 35% diphenyl / 65% dimethyl polysiloxane |
| Max. Temps.: | 300°C/320°C |
| USP Listing: | G42 |

**TraceGOLD TG-35MS GC columns**

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.25 | 15 | 0.25 | 26094-1300 | 1 Each |
| | 30 | 0.25 | 26094-1420 | 1 Each |
| | | 0.5 | 26094-2230 | 1 Each |
| 0.32 | 30 | 0.25 | 26094-1430 | 1 Each |
| | | 0.5 | 26094-2240 | 1 Each |
| 0.53 | 15 | 0.5 | 26094-2130 | 1 Each |
| | 30 | 1.0 | 26094-2980 | 1 Each |
| | | 1.5 | 26094-3360 | 1 Each |

**Applications:**

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

**Similar to:**

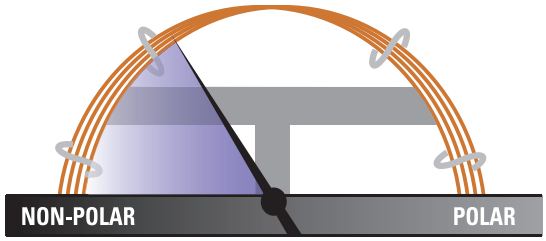
- Rtx-35
- BP-35
- HP-35
- SPB-35
- SPB-608

Learn more at **thermofisher.com/GCcolumns**

# 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




| | |
|---|---|
| Phase: | Modified 35% diphenyl / 65% dimethylpolysiloxane for basic compounds |
| Max. Temps.: | 220°C |
| USP Listing: | N/A |

### TraceGOLD TG-35MS AMINE GC columns

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.25 | 30 | 0.5 | 26092-2230 | 1 Each |
| | | 1.0 | 26092-2960 | 1 Each |
| 0.32 | 30 | 1.0 | 26092-2970 | 1 Each |
| | | 1.5 | 26092-3350 | 1 Each |
| 0.53 | 15 | 1.0 | 26092-2860 | 1 Each |
| | 30 | 1.0 | 26092-2980 | 1 Each |

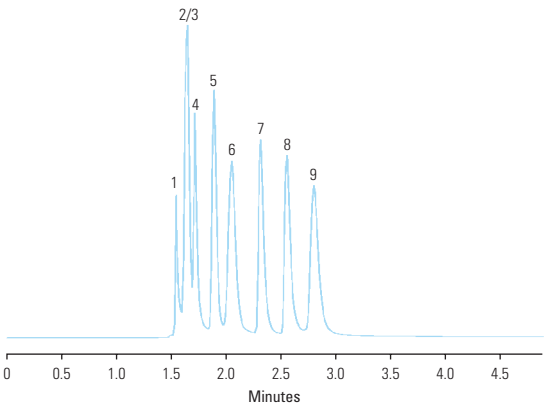
### Applications:

- 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**

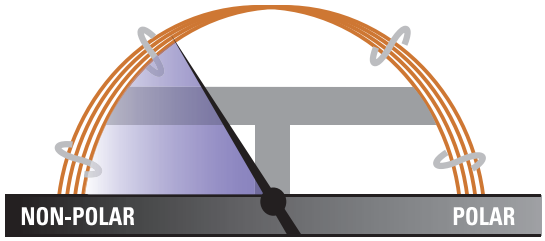
| | |
|---|---|
| Temperature: | 35°C (5 minute hold) Isothermal |
| Detector Type: | FID |
| Carrier Gas: | He |
| Flow Rate: | 35cm/sec |
| Injection Volume: | 1.0µL |
| Injection Mode: | Split (10:1), 250°C |

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

# 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




| | |
|---|---|
| Phase: | 6% cyanopropyl phenyl / 94% dimethyl polysiloxane |
| Max. Temps.: | 260°C/280°C |
| USP Listing: | G43 |

**TraceGOLD TG-1301MS GC columns**

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.25 | 30 | 0.25 | 26091-1420 | 1 Each |
| | | 1.0 | 26091-2960 | 1 Each |
| | 60 | 0.25 | 26091-1540 | 1 Each |
| | | 1.0 | 26091-3080 | 1 Each |
| 0.32 | 30 | 0.25 | 26091-1430 | 1 Each |
| | | 1.0 | 26091-2970 | 1 Each |
| | | 1.5 | 26091-3350 | 1 Each |
| | | 1.8 | 26091-3390 | 1 Each |
| | 60 | 1.8 | 26091-3410 | 1 Each |
| 0.53 | 30 | 1.0 | 26091-2980 | 1 Each |
| | | 3.0 | 26091-3960 | 1 Each |
| | 60 | 3.0 | 26091-4080 | 1 Each |

**Applications:**

- Alcohols
- Volatile organics
- Oxygenates
- Residual solvents

**Similar to:**

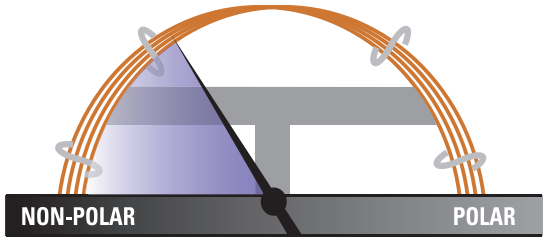
- Rtx-1301
- DB-1301
- BP-624
- HP-1301
- HP-624
- SPB-1301
- SPB-624
- VP-1301
- BF-624ms
- CP-1301
- CP-Select™ 624 CB

Learn more at **thermofisher.com/GCcolumns**

# 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




| | |
|---|---|
| Phase: | 6% cyanopropyl phenyl / 94% dimethyl polysiloxane |
| Max. Temps.: | 240°C |
| USP Listing: | G43 |

### TraceGOLD TG-624 GC columns

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

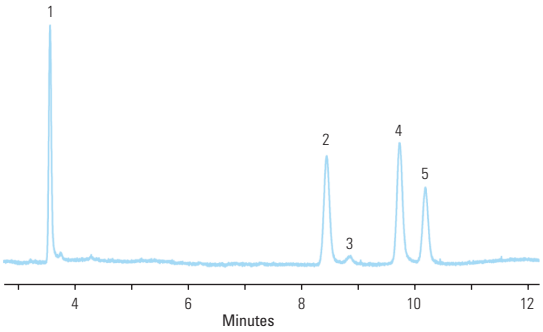
### Applications:

- 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

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

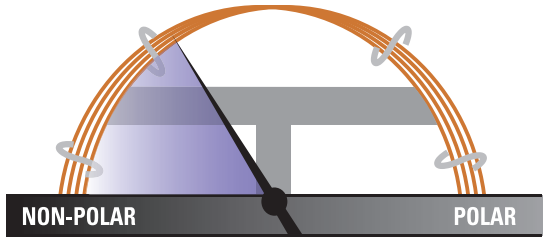
1. 1,1-dichloroethane
2. 1,1,1-trichloroethane
3. carbon tetrachloride
4. benzene
5. 1,2-dichloroethane



# TraceGOLD TG-624SilMS 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




| | |
|---|---|
| Phase: | 6% cyanopropylphenyl / 94% dimethyl arylene polysiloxane |
| Max. Temps.: | 320°C |
| USP Listing: | G43 |

### TraceGOLD TG-624SilMS GC columns

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.18 | 20 | 1.0 | 26059-4950 | 1 Each |
| 0.25 | 30 | 1.4 | 26059-3320 | 1 Each |
| | 60 | 1.4 | 26059-3330 | 1 Each |
| 0.32 | 30 | 1.8 | 26059-3390 | 1 Each |
| | 60 | 1.8 | 26059-3410 | 1 Each |
| 0.53 | 30 | 3.0 | 26059-3960 | 1 Each |
| | 60 | 3.0 | 26059-4080 | 1 Each |

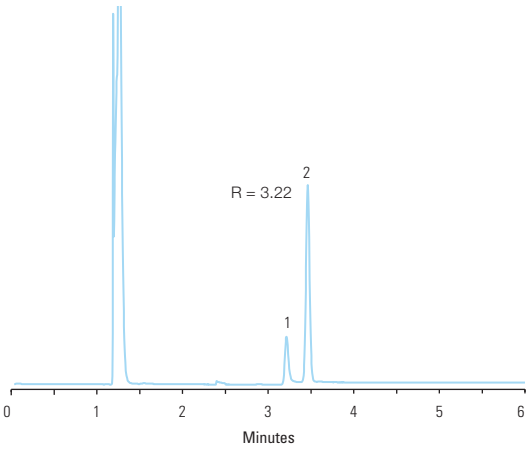
### Applications:

- 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-624SilMS 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 |

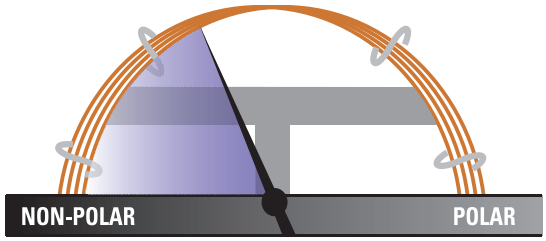
1. Acetonitrile
2. Dichloromethane

Learn more at **thermofisher.com/GCcolumns**

# 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




| | |
|---|---|
| Phase: | 14% cyanopropyl phenyl / 86% dimethyl polysiloxane |
| Max. Temps.: | 260°C/280°C |
| USP Listing: | G46 |

**TraceGOLD TG-1701MS GC columns**

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.25 | 30 | 0.25 | 26090-1420 | 1 Each |
| | | 0.5 | 26090-2230 | 1 Each |
| | | 1.0 | 26090-2960 | 1 Each |
| | 60 | 0.25 | 26090-1540 | 1 Each |
| | | 1.0 | 26090-3080 | 1 Each |
| 0.32 | 15 | 0.25 | 26090-1310 | 1 Each |
| | 30 | 0.25 | 26090-1430 | 1 Each |
| | | 0.5 | 26090-2240 | 1 Each |
| | | 1.0 | 26090-2970 | 1 Each |
| | 60 | 0.25 | 26090-1550 | 1 Each |
| | | 1.0 | 26090-3090 | 1 Each |
| 0.53 | 30 | 0.25 | 26090-1440 | 1 Each |
| | | 1.0 | 26090-2980 | 1 Each |
| | | 3.0 | 26090-3960 | 1 Each |

**Applications:**

- Alcohols
- Pesticides
- Oxygenates
- PCB cogeners
- Aroclor mixes

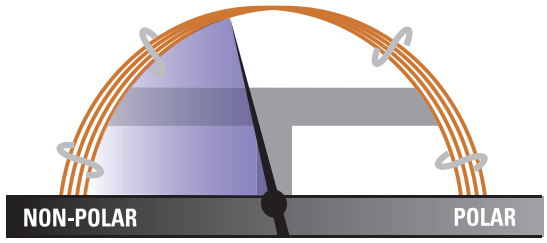
**Similar to:**

- 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




| | |
|---|---|
| Phase: | 50% diphenyl / 50% dimethyl polysiloxane |
| Max. Temps.: | 300°C/320°C |
| USP Listing: | G43 |

### TraceGOLD TG-17MS GC columns

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.25 | 15 | 0.25 | 26089-1300 | 1 Each |
| | 30 | 0.25 | 26089-1420 | 1 Each |
| | | 0.5 | 26089-2230 | 1 Each |
| | | 1.0 | 26089-2960 | 1 Each |
| | 60 | 0.25 | 26089-1540 | 1 Each |
| 0.32 | 30 | 0.25 | 26089-1430 | 1 Each |
| | | 0.5 | 26089-2240 | 1 Each |
| | | 1.0 | 26089-2970 | 1 Each |
| 0.53 | 30 | 0.25 | 26089-1440 | 1 Each |
| | | 1.0 | 26089-2980 | 1 Each |
| | | 1.5 | 26089-3360 | 1 Each |

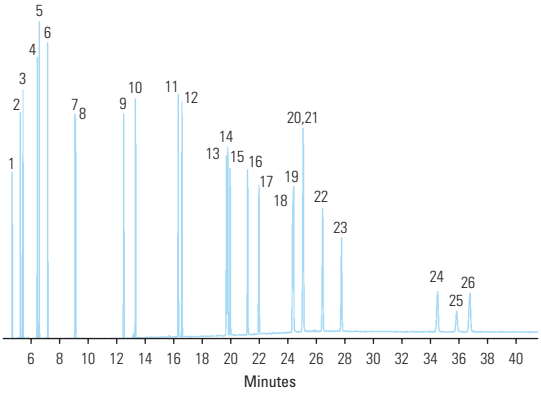
### Applications:

- 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 |

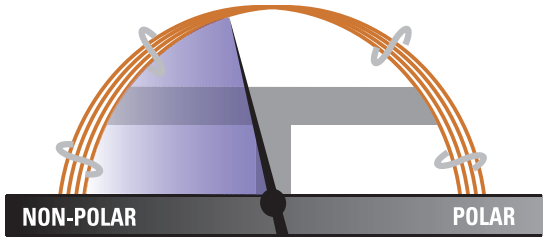
1. naphthalene
2. 1-methylnaphthalene
3. 2-methylnaphthalene
4. acenaphthylene
5. acenaphthene
6. fluorene
7. phenanthrene
8. anthracene
9. fluoranthene
10. pyrene
11. benzo(a)anthracene
12. chrysene
13. benzo(b)fluoranthene
14. benzo(k)fluoranthene
15. benzo(j)fluoranthene
16. benzo(a)pyrene
17. 3-methylcholanthrene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

Learn more at **thermofisher.com/GCcolumns**

# TraceGOLD TG-17SilMS 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




| | |
|---|---|
| Phase: | 50% phenyl / 50% dimethyl arylene polysiloxane |
| Max. Temps.: | 340/360°C |
| USP Listing: | G3 |

**TraceGOLD TG-17SilMS GC columns**

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.15 | 10 | 0.15 | 26072-2750 | 1 Each |
| 0.18 | 20 | 0.18 | 26072-5780 | 1 Each |
| 0.25 | 30 | 0.25 | 26072-1420 | 1 Each |
| 0.32 | 30 | 0.25 | 26072-1430 | 1 Each |

**Applications:**

- PAHs
- Pesticides and herbicides
- Phthalate esters
- Triglycerides

**Similar to:**

- DB-1 7ms
- VF-17ms
- CP-Sil 24 CB
- ZB-50
- BPX-50

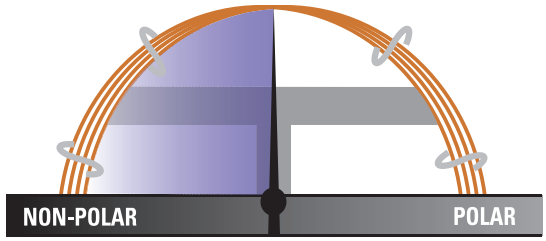
Learn more at **thermofisher.com/GCcolumns**



# 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




| | |
|---|---|
| Phase: | 50% cyanopropyl / 50% phenyl methyl polysiloxane |
| Max. Temps.: | 220°C/240°C |
| USP Listing: | G7, G19 |

## TraceGOLD TG-225MS GC columns

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.25 | 30 | 0.25 | 26083-1420 | 1 Each |
| | 60 | 0.25 | 26083-1540 | 1 Each |
| 0.32 | 30 | 0.25 | 26083-1430 | 1 Each |

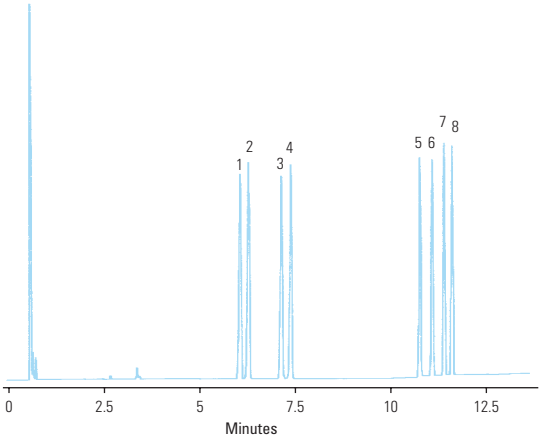
### Applications:

- 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 |

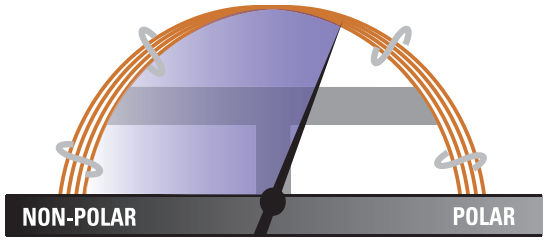
1. rhamnitol
2. fucitol
3. ribitol
4. arabinitol
5. mannitol
6. galactitol
7. glucitol
8. inositol

Learn more at **thermofisher.com/GCcolumns**

# 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




| | |
|---|---|
| Phase: | TrifluoropropylmethyI PolysiIoxane |
| Max. Temps.: | 320°C/340°C |
| USP Listing: | G6 |

**TraceGOLD TG-200MS GC columns**

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.15 | 20 | 0.15 | 26084-2760 | 1 Each |
| 0.25 | 30 | 0.25 | 26084-1420 | 1 Each |
| | | 1.0 | 26084-2960 | 1 Each |
| 0.32 | 30 | 0.25 | 26084-1430 | 1 Each |
| | | 0.5 | 26084-2240 | 1 Each |
| | | 1.0 | 26084-2970 | 1 Each |

**Applications:**

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

**Similar to:**

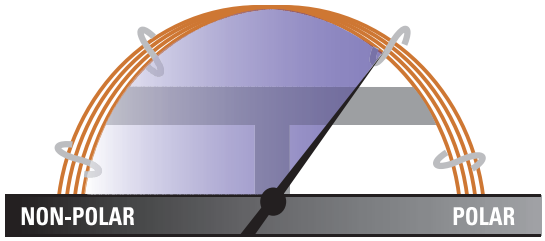
- Rtx-200MS
- DB-200
- DB-210



# 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




| | |
|---|---|
| Phase: | Polyethylene Glycol (PEG) |
| Max. Temps.: | 240/260°C |
| USP Listing: | G14, G15, G20, G39 |

### TraceGOLD TG-WaxMS GC columns

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.1 | 10 | 0.1 | 26088-0200 | 1 Each |
| 0.25 | 15 | 0.25 | 26088-1300 | 1 Each |
| | 30 | 0.25 | 26088-1420 | 1 Each |
| | | 0.5 | 26088-2230 | 1 Each |
| | 30 with 5m SafeGuard | 0.25 | 26088-1421 | 1 Each |
| | 60 | 0.25 | 26088-1540 | 1 Each |
| | | 0.5 | 26088-2350 | 1 Each |
| 0.32 | 15 | 0.5 | 26088-2120 | 1 Each |
| | 30 | 0.25 | 26088-1430 | 1 Each |
| | | 0.5 | 26088-2240 | 1 Each |
| | | 1.0 | 26088-2970 | 1 Each |
| | 30m with 5m SafeGuard | 0.25 | 26088-1435 | 1 Each |
| | 60 | 0.25 | 26088-1550 | 1 Each |
| | | 0.5 | 26088-2360 | 1 Each |
| | | 1.0 | 26088-3090 | 1 Each |
| 0.53 | 15 | 0.5 | 26088-2130 | 1 Each |
| | | 1.0 | 26088-2860 | 1 Each |
| | 30 | 0.25 | 26088-1440 | 1 Each |
| | | 0.5 | 26088-2250 | 1 Each |
| | | 1.0 | 26088-2980 | 1 Each |
| | | 1.5 | 26088-3360 | 1 Each |
| | 60 | 0.25 | 26088-1560 | 1 Each |
| | | 0.5 | 26088-2370 | 1 Each |
| | | 1.0 | 26088-3100 | 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

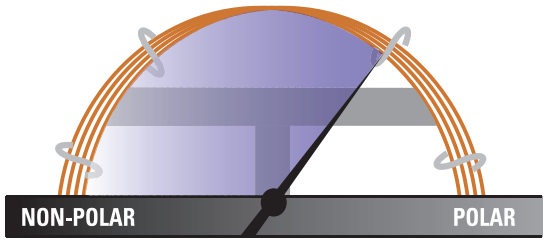
| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.25 | 30 | 0.25 | 26M88-1420 | 1 Each |
| | 60 | 0.25 | 26M88-1540 | 1 Each |

Learn more at **thermofisher.com/GCcolumns**

# 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




| | |
|---|---|
| Phase: | Modified Polyethylene Glycol (PEG) for Acidic Compounds |
| Max. Temps.: | 240°C / 250°C |
| USP Listing: | G25, G35 |

### TraceGOLD TG-WaxMS A GC columns

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.25 | 15 | 0.25 | 26087-1300 | 1 Each |
| | 30 | 0.25 | 26087-1420 | 1 Each |
| | | 0.5 | 26087-2230 | 1 Each |
| | 60 | 0.25 | 26087-1540 | 1 Each |
| 0.32 | 15 | 0.25 | 26087-1310 | 1 Each |
| | 30 | 0.25 | 26087-1430 | 1 Each |
| | | 0.5 | 26087-2240 | 1 Each |
| | | 1.0 | 26087-2970 | 1 Each |
| 0.53 | 15 | 1.0 | 26087-2860 | 1 Each |
| | 30 | 0.25 | 26087-1440 | 1 Each |
| | | 1.0 | 26087-2980 | 1 Each |

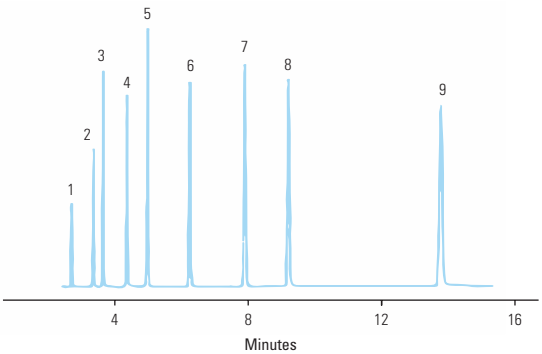
### Applications:

- 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**

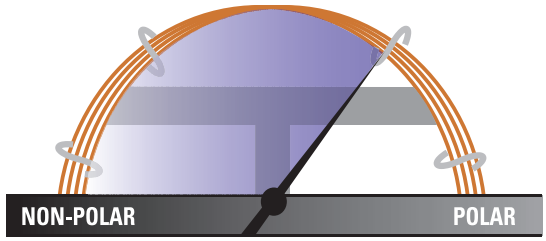
| | |
|---|---|
| Temperature: | 145°C Isothermal |
| Detector Type: | FID |
| Carrier Gas: | Hydrogen |
| Flow Rate: | 40cm/sec |
| Injection Volume: | 1.0µL |
| Injection Mode: | Split (50:1), 250°C |

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




| | |
|---|---|
| Phase: | Modified Polyethylene Glycol (PEG) for Basic Compounds |
| Max. Temps.: | 200°C/220°C |
| USP Listing: | N/A |

### TraceGOLD TG-WaxMS B GC columns

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.25 | 30 | 0.25 | 26086-1420 | 1 Each |
| | | 0.5 | 26086-2230 | 1 Each |
| 0.32 | 30 | 0.25 | 26086-1430 | 1 Each |
| 0.53 | 30 | 1.0 | 26086-2980 | 1 Each |

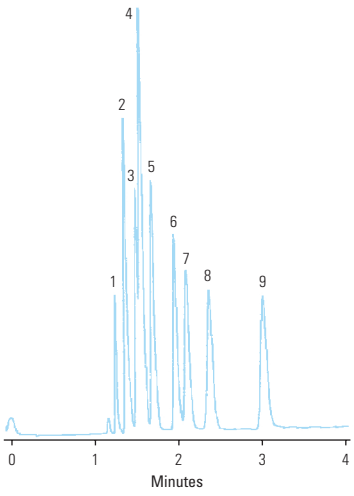
### Applications:

- 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 |

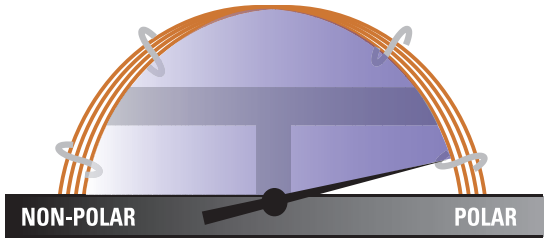
1. trimethylamine
2. dimethylamine
3. ethylamine
4. methylamine
5. isopropylamine
6. n-propylamine
7. tert-butylamine
8. diethylamine
9. sec-butylamine

Learn more at **thermofisher.com/GCcolumns**

# 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




| | |
|---|---|
| Phase: | 90% biscyanopropyl / 10% cyanopropyl phenyl polysiloxane |
| Max. Temps.: | 260°C/275°C |
| USP Listing: | G8, G48 |

## TraceGOLD TG-POLAR GC columns

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.25 | 30 | 0.1 | 26082-0470 | 1 Each |
| | | 0.2 | 26082-5010 | 1 Each |
| | 60 | 0.1 | 26082-0590 | 1 Each |
| | | 0.2 | 26082-5020 | 1 Each |
| | 105 | 0.1 | 26082-5000 | 1 Each |
| | | 0.2 | 26082-5030 | 1 Each |
| 0.32 | 30 | 0.2 | 26082-5040 | 1 Each |
| | 60 | 0.2 | 26082-5050 | 1 Each |

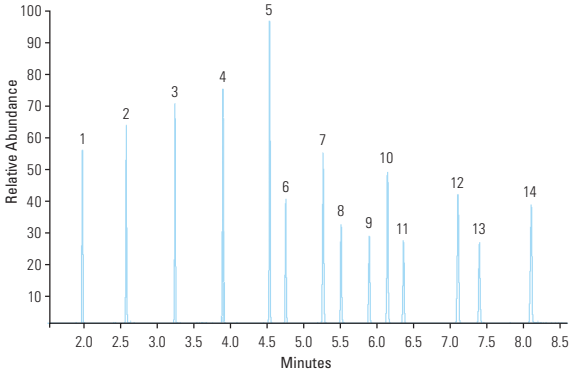
**Applications:**

- 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**

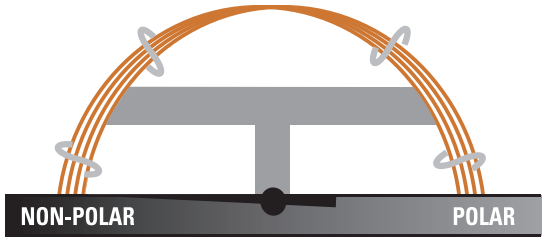
| | |
|---|---|
| Temperature: | 100°C (0.5 minute hold) to 195°C at 25°C/minute (1 minute hold) to 250°C at 10°C/minute (3 minute hold) |
| Detector Type: | MS |
| Carrier Gas: | He |
| Flow Rate: | 1.2mL/min |
| Injection Volume: | 0.1µL |
| Injection Mode: | Split (100:1), 250°C |

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

# 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




| | |
|---|---|
| Phase: | Proprietary |
| Max. Temps.: | 340°C/360°C |
| USP Listing: | N/A |

### TraceGOLD TG-XLBMS GC columns

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.18 | 20 | 0.18 | 26079-5780 | 1 Each |
| 0.25 | 15 | 0.25 | 26079-1300 | 1 Each |
| | 30 | 0.25 | 26079-1420 | 1 Each |
| | | 0.5 | 26079-2230 | 1 Each |
| | 60 | 0.25 | 26079-1540 | 1 Each |
| 0.32 | 30 | 0.25 | 26079-1430 | 1 Each |

### Semi-Volatile organic compounds (SVOC) application kit

| Description | Cat. No | Quantity |
|---|---|---|
| Semi-Volatile Organic Compounds (SVOC) Application kit | 60181-736 | 1 Each |
| **Contains the following:** | | |
| TG-5MS GC COLUMN 30MX0.25MMX 0.50MM | 26098-2230 | 1 Each |
| BTO Septa 11mm Diameter (Blister Pack) | 31303233-BP | 50 Pack |
| LINERGOLD PRECISION LINER, WOOL, 4X6.3X78.5MM 5PK | 453A1255-UI | 5 Pack |
| LinerGOLD Splitless Liner, Single Taper, Wool 4x6.5x78.5mm | 453A1925-UI | 5 Pack |
| Gold Plated Inlet Seals, 0.8mm | 290GA082 | 2 Pack |
| Liner Sealing Ring for SSL / 5pk | 29001320 | 5 Pack |
| Column Nut for SSL & SSLBackflush | 35050458 | 5 Pack |
| 15/85 GRAPH/VESP Ferrule for 0.1-0.25mmID column | 290VA191 | 10 Pack |
| SILANIZED AMB TARGET DP-IDVIAL, 100/PK | c4000-s2w | 100 Pack |
| AVCS BLUE CAP&TS SEPTA100/PK,1000/CS | c5000-54b | 100 Pack |
| 10UL FN SYRINGE, 50MM LENGTH23 GAUGE, CONE 1/PK | 36520060 | 1 Each |

### Applications

- Pesticides
- PCB congeners
- PAHs
- Aroclor mixes

### Similar to:

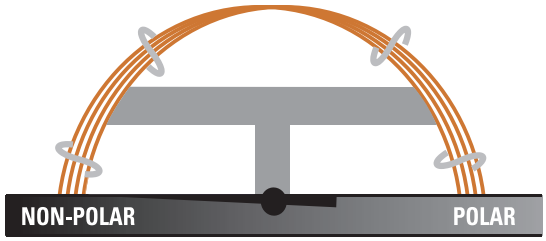
- Rxi-XLB
- DB-XLB
- VF-Xms

Learn more at **thermofisher.com/GCcolumns**

# 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




| | |
|---|---|
| Phase: | Proprietary |
| Max. Temps.: | 260°C |
| USP Listing: | N/A |

**TraceGOLD TG-VRX GC columns**

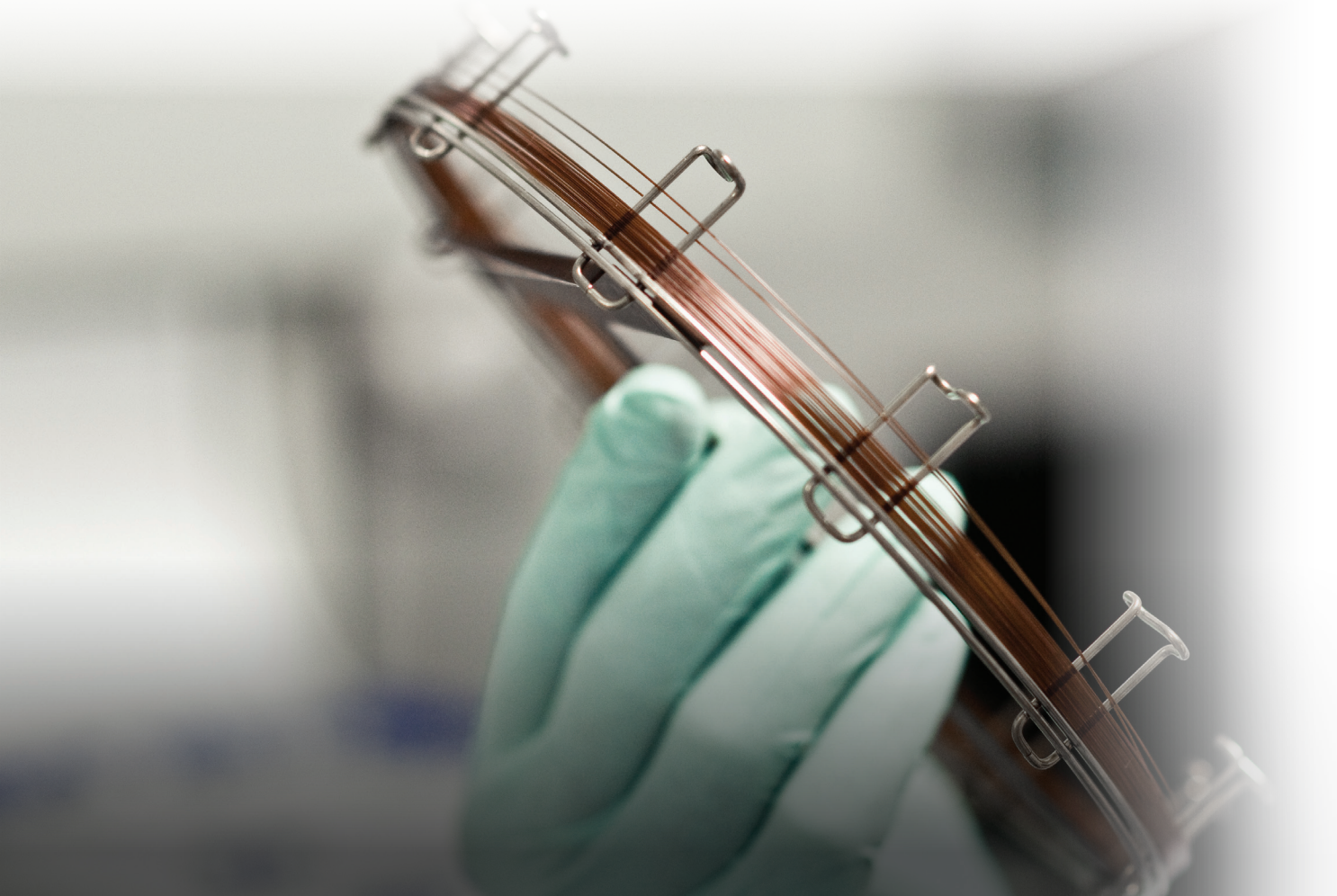
| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.18 | 20 | 1.0 | 26081-4950 | 1 Each |
| | 40 | 1.0 | 26081-4960 | 1 Each |
| 0.25 | 30 | 1.4 | 26081-3320 | 1 Each |
| | 60 | 1.4 | 26081-3330 | 1 Each |
| 0.32 | 30 | 1.8 | 26081-3390 | 1 Each |
| | 60 | 1.8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

**Applications:**

- Volatile organic pollutants
- US EPA Method 8021 compounds

**Similar to:**

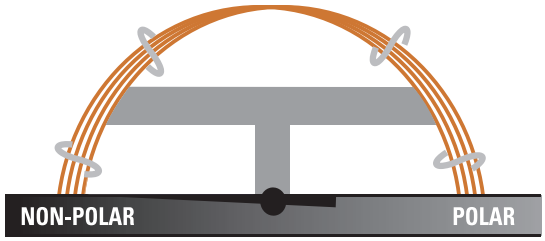
- Rtx-VRX
- DB-VRX



# 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




| | |
|---|---|
| Phase: | Proprietary |
| Max. Temps.: | 260°C |
| USP Listing: | N/A |

### TraceGOLD TG-VMS GC columns

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.18 | 20 | 1.0 | 26080-4950 | 1 Each |
| 0.25 | 30 | 1.4 | 26080-3320 | 1 Each |
| | 60 | 1.4 | 26080-3330 | 1 Each |
| 0.32 | 60 | 1.8 | 26080-3410 | 1 Each |

**Applications:**

- Volatile organic pollutants
- US EPA Method 8260B compounds

**Similar to:**

- Rtx-VMS

### Volatile organic compound (VOC) application kit

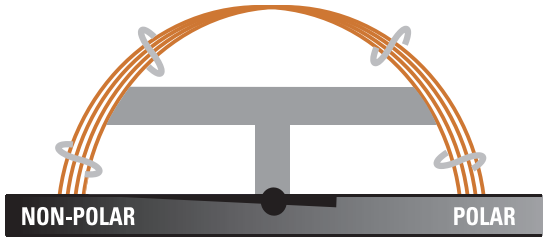
| Description | Cat. No. | Quantity |
|---|---|---|
| Volatile Organic Compound(VOC) Apps Kit | 60181-734 | 1 Each |
| **Contains the following:** | | |
| TG-VMS GC Column,20mx0.18mmx 1.00µm | 26080-4950 | 1 Each |
| BTO Septa 11mm Diameter (Blister Pack) | 31303233-BP | 50 Pack |
| LinerGOLD Split Liner 1x6.3x78.5mm | 453A1335-UI | 5 Pack |
| LinerGOLD Splitless Liner, Single Taper, Wool 4x6.5x78.5mm | 453A1925-UI | 5 Pack |
| Gold Plated Inlet Seals, 0.8mm | 290GA082 | 2 Pack |
| Liner Sealing Ring for SSL | 29001320 | 5 Pack |
| Column Nut for SSL & SSLBackflush | 35050458 | 5 Pack |
| 15/85 GRAPH/VESP Ferrule for 0.1-0.25mmID column | 290VA191 | 10 Pack |
| SILANIZED AMB TARGET DP-IDVIAL, | c4000-s2w | 100 Pack |
| AVCS BLUE CAP&TS SEPTA | c5000-54b | 100 Pack |
| CLR 40ML EPA ASM VIAL KIT,1000 CLASS, | B7950 | 100 Pack |

Learn more at **thermofisher.com/GCcolumns**

# 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




| | |
|---|---|
| Phase: | Proprietary |
| Max. Temps.: | 340°C |
| USP Listing: | N/A |

### TraceGOLD TG-OCP I GC columns

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.25 | 30 | 0.25 | 26078-1420 | 1 Each |
| 0.32 | 30 | 0.32 | 26078-5760 | 1 Each |

### TraceGOLD TG-OCP II GC columns

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.18 | 20 | 0.14 | 26077-5690 | 1 Each |
| 0.25 | 30 | 0.2 | 26077-5720 | 1 Each |
| 0.32 | 30 | 0.25 | 26077-1430 | 1 Each |

**Applications:**

- Organochlorine pesticides
- Herbicides

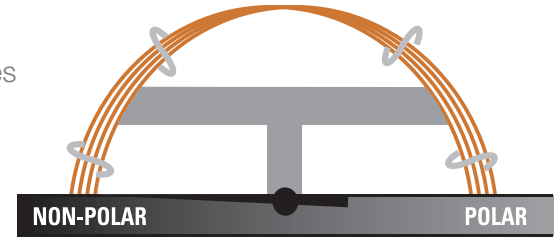
**Similar to:**

- Rtx-CLPesticides/ Rtx-CLPesticides2

# 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




| | |
|---|---|
| Phase: | Proprietary |
| Max. Temps.: | 330°C |
| USP Listing: | N/A |

### TraceGOLD TG-OPP I GC columns

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.25 | 30 | 0.25 | 26076-1420 | 1 Each |
| 0.32 | 30 | 0.5 | 26076-2240 | 1 Each |

### TraceGOLD TG-OPP II GC columns

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

**Applications:**

- Organophosphorus pesticides

**Similar to:**

- Rtx-OPPesticides/ Rtx-OPPesticides2

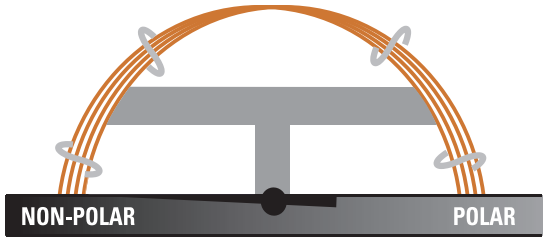
Learn more at **thermofisher.com/GCcolumns**



# 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




| | |
|---|---|
| Phase: | Proprietary |
| Max. Temps.: | 260°C |
| USP Listing: | N/A |

### TraceGOLD TG-ALC Plus I GC columns

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

### TraceGOLD TG-ALC Plus II GC columns

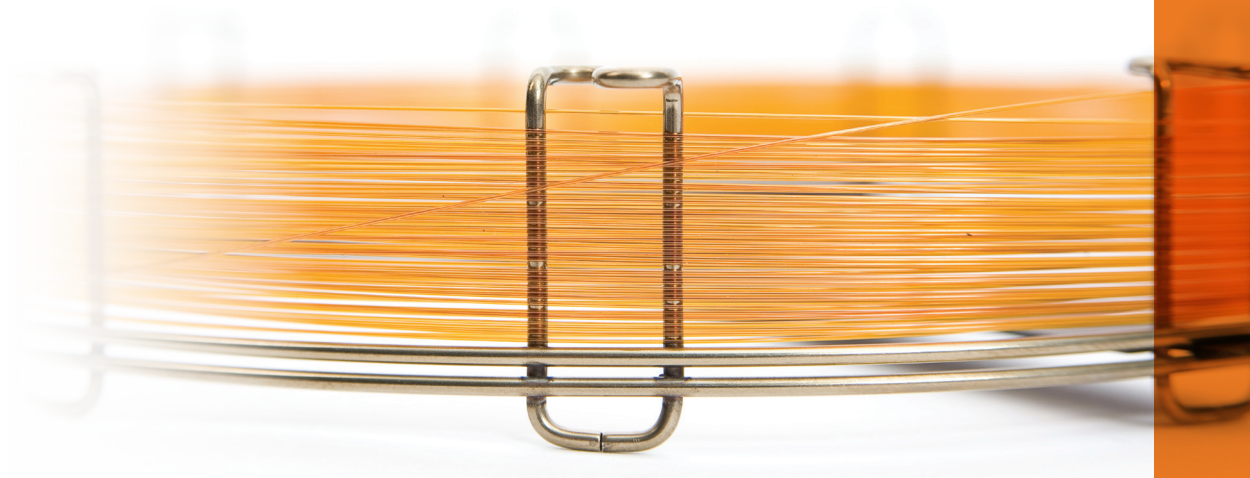
| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.32 | 30 | 0.5 | 26063-2240 | 1 Each |
| 0.53 | 30 | 1.0 | 26063-2980 | 1 Each |

**Applications:**

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

**Similar to:**

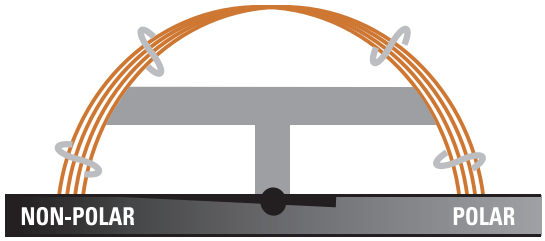
- Rtx BAC Plus 1 / Rtx BAC Plus 2



# 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




| | |
|---|---|
| Phase: | Proprietary |
| Max. Temps.: | 340°C |
| USP Listing: | N/A |

### TraceGOLD TG-Dioxin GC columns

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

### Persistent organic pollutants (POPs) confirmation kit

| Description | Cat. No | Quantity |
|---|---|---|
| Persistent Organic Pollutants (POPs) Confirmation kit | TS-MKITG503 | 1 Each |
| **Contains the following:** | | |
| TG-Dioxin GC Column 60m x0.25mmx0.25µm | 26066-1540 | 1 Each |
| BTO Septa 11mm Diameter (Blister Pack) | 31303233-BP | 50 Pack |
| LINERGOLD PRECISION LINER, WOOL, 4X6.3X78.5MM 5PK | 453A1255-UI | 5 Pack |
| LinerGOLD Splitless Liner, Single Taper, Wool 4x6.5x78.5mm | 453A1925-UI | 5 Pack |
| GOLD PLATED INLET SEALS, FORAGILENT GC'S, 0.8MM, 2PK | 290GA082 | 2 Pack |
| Liner Sealing Ring for SSL | 29001320 | 5 Pack |
| Column Nut for SSL & SSLBackflush | 35050458 | 5 Pack |
| 15/85 GRAPH/VESP Ferrule for 0.1-0.25mmID column | 290VA191 | 10 Pack |
| 1.1ML SCREW VIAL 500/PK CLR TAPERED 12x32MM | 1.1-STVG | 500 Pack |
| 8mm SCREW CAP 500/PK PREFI WITH SILICONE/ TEFLON LINER | 8-SC-ST15 | 500 Pack |
| 10UL FN SYRINGE, 57MM LENGTH23S GAUGE, CONE 1/PK | 365D0271 | 1 Each |

### Applications:

- Dioxins
- Furans

### Similar to:

- Rtx-Dioxin2
- DB-Dioxin

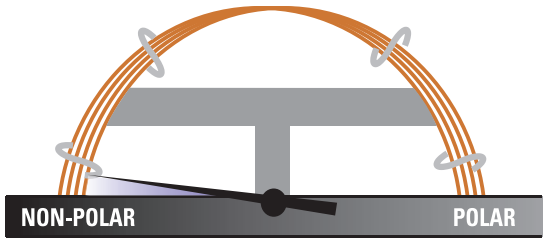
Learn more at **thermofisher.com/GCcolumns**

# 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 | 260A130P | 1 Each |
| | 30 | 0.1 | 260A047P | 1 Each |
| | | 0.25 | 260A142P | 1 Each |
| | 60 | 0.25 | 260A154P | 1 Each |
| 0.32 | 15 | 0.25 | 260A131P | 1 Each |
| | 30 | 0.25 | 260A143P | 1 Each |

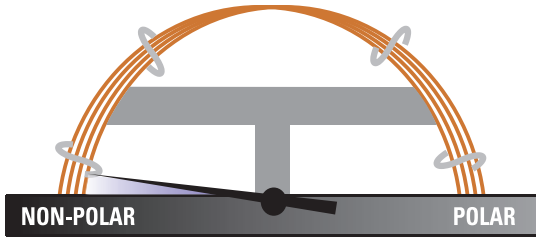
**Applications:**

- 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 | 260B047P | 1 Each |
| | | 0.25 | 260B142P | 1 Each |
| | 60 | 0.25 | 260B154P | 1 Each |
| 0.32 | 30 | 0.25 | 260B143P | 1 Each |
| | 60 | 0.25 | 260B155P | 1 Each |
| | | 1.0 | 260B309P | 1 Each |

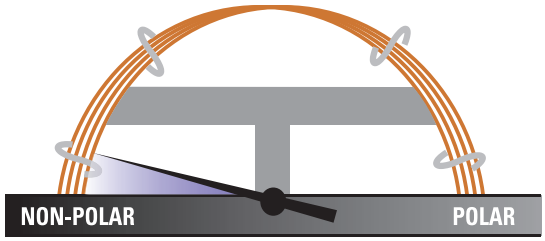
**Applications:**

- 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




| | |
|---|---|
| Phase: | 5% Phenyl Methylpolysiloxane |
| Max. Temps.: | 320°C/340°C for films ≤1.5µm<br>280°C/300°C for films >1.5µm |
| USP Listing: | G27, G36 |

**TRACE TR-5 GC columns**

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

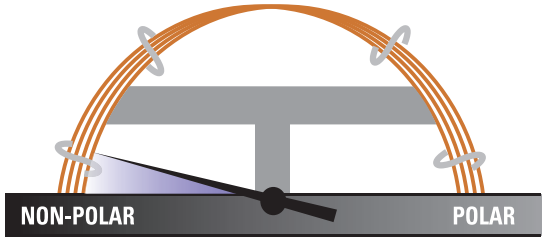
**Applications:**

- 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




| | |
|---|---|
| Phase: | 5% Phenyl Polycarborane Siloxane |
| Max. Temps.: | 380°C/400°C |
| USP Listing: | G27, G36 |

**TRACE TR-5HT GC columns**

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

**Applications:**

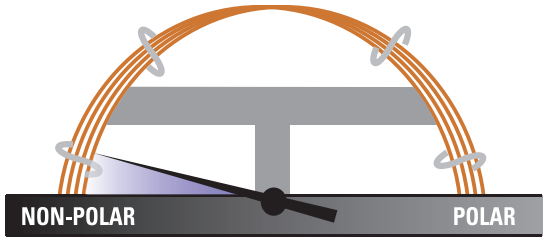
- Hydrocarbons
- Solvents
- Pesticides
- Herbicides
- Phenols
- Amines

Learn more at **thermofisher.com/GCcolumns**

# 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<br>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 | 260F020P | 1 Each |
| 0.18 | 20 | 0.18 | 260F578P | 1 Each |
| 0.25 | 15 | 0.1 | 260F035P | 1 Each |
| | | 0.25 | 260F130P | 1 Each |
| | 30 | 0.1 | 260F047P | 1 Each |
| | | 0.25 | 260F142P | 1 Each |
| | | 0.25 | 260F142J | 1 Each |
| | | 0.5 | 260F223P | 1 Each |
| | | 1.0 | 260F296P | 1 Each |
| | 60 | 0.25 | 260F154P | 1 Each |
| | | 1.0 | 260F308P | 1 Each |
| 0.32 | 15 | 1.0 | 260F285P | 1 Each |
| | 30 | 0.25 | 260F143P | 1 Each |
| | | 0.5 | 260F224P | 1 Each |
| | | 1.0 | 260F297P | 1 Each |
| 0.53 | 30 | 0.5 | 260F225P | 1 Each |
| | | 1.0 | 260F298P | 1 Each |
| | | 1.5 | 260F336P | 1 Each |
| | | 3.0 | 260F396P | 1 Each |

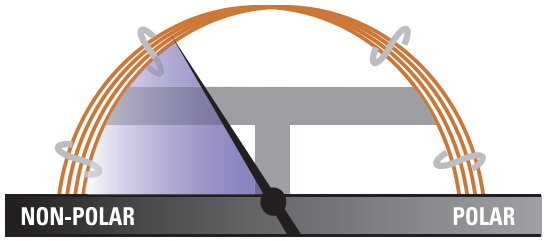
**Applications:**

- 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




| | |
|---|---|
| Phase: | 35% Phenyl Polysilphenylene-siloxane |
| Max. Temps.: | 330°C/360°C |
| USP Listing: | G42 |

### TRACE TR-35MS GC columns

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

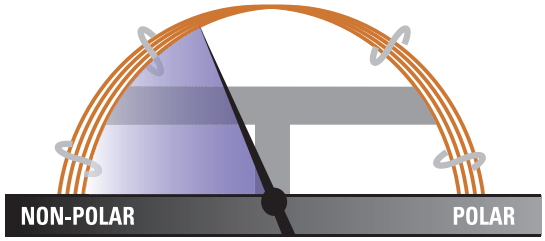
**Applications:**

- 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




| | |
|---|---|
| Phase: | 14% Cyanopropylphenyl Polysiloxane |
| Max. Temps.: | 280°C/300°C |
| USP Listing: | G46 |

### TRACE TR-1701 GC columns

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

**Applications:**

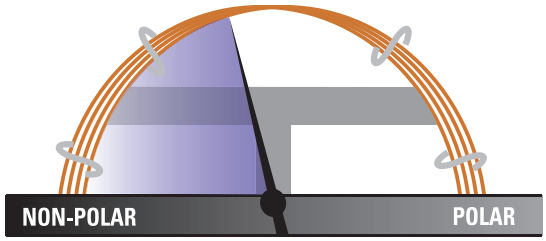
- Pesticides
- PCBs
- PAHs
- Organic acids
- Drugs
- Steroids
- EPA 608, 8081

Learn more at **thermofisher/GCcolumns**

## 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




| | |
|---|---|
| Phase: | 50% Phenyl Polysilphenylene-siloxane |
| Max. Temps.: | 360°C/370°C |
| USP Listing: | G3 |

**TRACE TR-50MS GC columns**

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.25 | 30 | 0.25 | 260R142P | 1 Each |
| 0.32 | 30 | 0.25 | 260R143P | 1 Each |

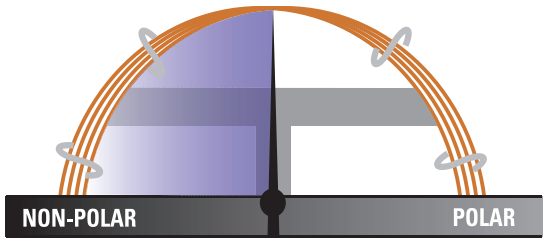
**Applications:**

- 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




| | |
|---|---|
| Phase: | 50% Cyanopropylphenyl Polysiloxane |
| Max. Temps.: | 230°C / 250°C |
| USP Listing: | G7 |

**TRACE TR-225 GC columns**

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.25 | 30 | 0.25 | 260Y142P | 1 Each |

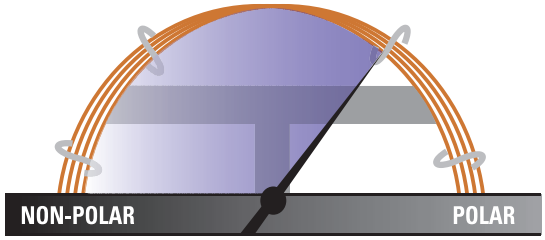
**Applications:**

- 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




| | |
|---|---|
| Phase: | Polyethylene Glycol (PEG) |
| Max. Temps.: | 260°C/280°C for films <1.0µm<br>240°C/260°C for 1.0µm films |
| USP Listing: | G16, G20 |

**TRACE TR-Wax GC columns**

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

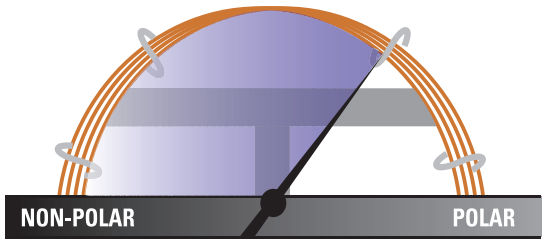
**Applications:**

- 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




| | |
|---|---|
| Phase: | Polyethylene Glycol (PEG) |
| Max. Temps.: | 260°C/280°C |
| USP Listing: | G16 |

**TRACE TR-WaxMS GC columns**

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

**Applications:**

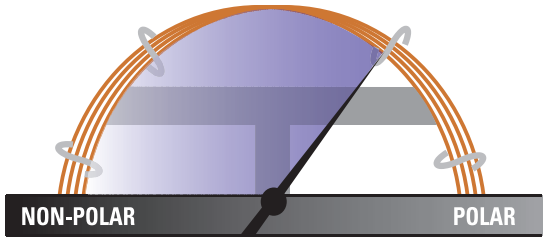
- Aromatic hydrocarbons
- Food additives
- Essential oils
- Alcohols
- Esters
- Aldehydes
- Ketones

Learn more at **thermofisher.com/GCcolumns**

## 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




| | |
|---|---|
| Phase: | TPA Modified Polyethylene Glycol (PEG) |
| Max. Temps.: | 240°C/250°C |
| USP Listing: | G25, G35 |

### TRACE TR-FFAP GC Columns

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

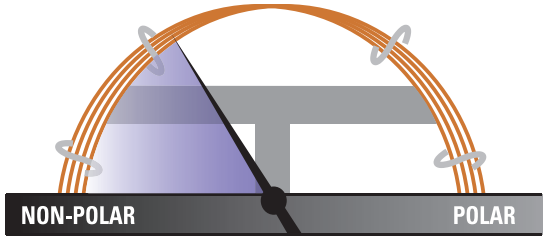
**Applications:**

- 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




| | |
|---|---|
| Phase: | 6% Cyanopropylphenyl Polysiloane |
| Max. Temps.: | 280°C/300°C |
| USP Listing: | G43 |

### TRACE TR-V1 GC columns

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

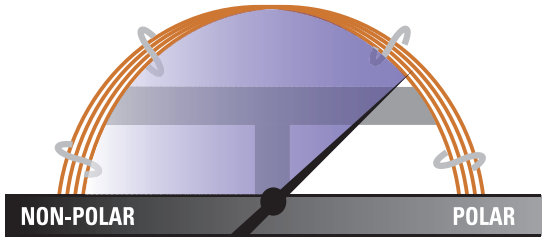
**Applications:**

- 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




| | |
|---|---|
| Phase: | 70% Cyanopropyl Polysilphenylene-siloxane |
| Max. Temps.: | 250°C/260°C |
| USP Listing: | N/A |

**TRACE TR-FAME GC columns**

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.10 | 10 | 0.2 | 260M096P | 1 Each |
| 0.22 | 25 | 0.25 | 260M135P | 1 Each |
| | 30 | 0.25 | 260M141P | 1 Each |
| | 50 | 0.25 | 260M147P | 1 Each |
| | 60 | 0.25 | 260M153P | 1 Each |
| 0.25 | 30 | 0.25 | 260M142P | 1 Each |
| | 60 | 0.25 | 260M154P | 1 Each |
| | 100 | 0.20 | 260M154P | 1 Each |
| | 100 | 0.20 | 260M238P | |
| | 120 | 0.25 | 260M166L | 1 Each |
| 0.32 | 25 | 0.25 | 260M137P | 1 Each |
| | 30 | 0.25 | 260M143P | 1 Each |
| | 60 | 0.25 | 260M155P | 1 Each |

**Applications:**

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

Learn more at **thermofisher.com/GCcolumns**

## 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 | 26RV495P | 1 Each |
| TR-525 | 0.25 | 30 | 0.25 | 26RX142P | 1 Each |
| TR-8095 | 0.32 | 12 | 0.25 | 260P123P | 1 Each |
| TR-8270 | 0.25 | 30 | 0.5 | 26RF223P | 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 | 26RF142F | 1 Each |
| TR-Pesticide II | 0.25 | 30 | 0.25 | 5m guard column attached | 26RD142F | 1 Each |
| TR-Pesticide III | 0.25 | 30 | 0.25 | 5m guard column attached | 26RC142F | 1 Each |
| TR-Pesticide IV | 0.25 | 30 | 0.25 | – | 26RC142P | 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 cogeners 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 | 26AJ148P | 1 Each |
| TR-Dioxin 5MS | 0.25 | 60 | 0.25 | 26AF154P | 1 Each |
| TR-Dioxin 5MS | 0.25 | 30 | 0.1 | 26AF047P | 1 Each |
| TR-Dioxin 5MS | 0.25 | 60 | 0.1 | 26AF059P | 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 | 26AA395P | 1 Each |
| TR-BioDiesel (G) | EN 14105 | 0.32 | 10 | 0.1 | 26AF024P | 1 Each |
| TR-BioDiesel (F) | EN 14103 | 0.25 | 30 | 0.25 | 26AX142P | 1 Each |
| TR-BioDiesel (G) ASTM | ASTM D-6584 | 0.32 | 10 | 0.1 | 26RF024P | 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 | 26AC497P | 1 Each |
| TR-DoA5 | 0.25 | 15 | 0.25 | 26AF130P | 1 Each |

**Applications:**

- Amphetamines, codeine and morphine

Learn more at **thermofisher.com/GCcolumns**

# 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 Thermo Scientific™ UltraFast™ GC columns

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

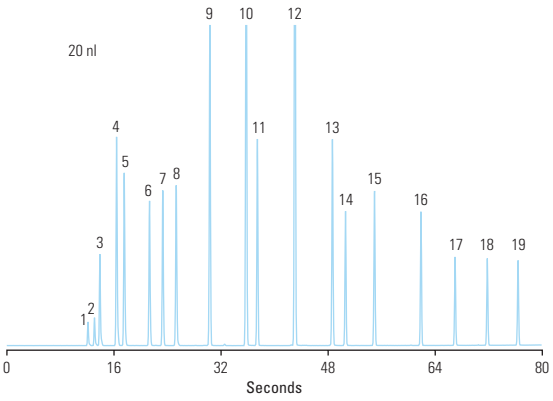
**UFC-1 10m x 0.32mm x 3um**

| | |
|---|---|
| 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 |

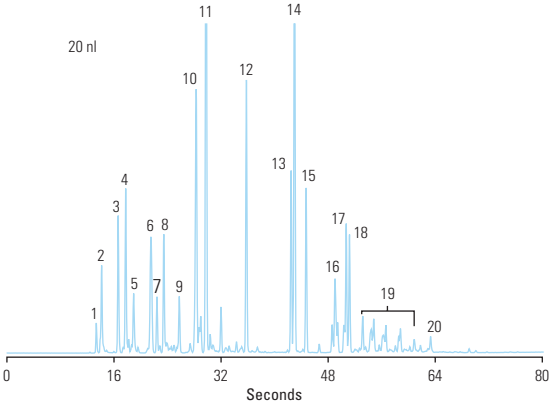
## Application – UltraFast Analysis of Pure Petroleum Products through Nanovolumes Injection

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.




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




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

# 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 | UFMC00001010401 | 1 Each |
| | 0.32 | 5 | 0.25 | ISO 9377-2 | UFMC00001070404 | 1 Each |
| UFC-5 | 0.10 | 5 | 0.4 | General | UFMC00200000000 | 1 Each |
| | | 5 | 0.1 | General | UFMC00300000000 | 1 Each |
| | | 10 | 0.4 | General | UFMC00502010006 | 1 Each |
| UFC-WAX | 0.10 | 5 | 0.1 | FAMES, Essential Oils | UFMC00001010501 | 1 Each |
| | | 5 | 0.2 | General | UFMC00001010503 | 1 Each |
| UFC-264 | 0.10 | 10 | 0.5 | Volatiles | UFMC00002010207 | 1 Each |
| UFC-M1 | 0.32 | 5 | 0.25 | General | UFMC00001070904 | 1 Each |



Learn more at **thermofisher.com/GCcolumns**

# TracePLOT GC columns

## Thermo Scientific™ TracePLOT™ TG-BOND Alumina GC columns: $Na_2SO_4$ 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 |
|---|---|---|---|---|
| $Na_2SO_4$ Deactivation | | | | |
| 0.32 | 30 | 5 | 26001-6020 | 1 Each |
| | 50 | 5 | 26001-6050 | 1 Each |
| 0.53 | 30 | 10 | 26001-6080 | 1 Each |
| | 50 | 10 | 26001-6110 | 1 Each |
| KCl Deactivation | | | | |
| 0.32 | 30 | 5 | 26002-6020 | 1 Each |
| | 50 | 5 | 26002-6050 | 1 Each |
| 0.53 | 30 | 10 | 26002-6080 | 1 Each |
| | 50 | 10 | 26002-6110 | 1 Each |

**Applications:**

- C1-C5 hydrocarbons
- Unsaturated hydrocarbon isomers

## TracePLOT TG-BOND Sieve 5A GC columns

Designed for separation of $Ar/O_2$ 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 Sieve 5A GC Columns**

| ID (mm) | Length (m) | Film Thickness (µm) | Cat. No. | Quantity |
|---|---|---|---|---|
| 0.32 | 15 | 30 | 26003-6010 | 1 Each |
| | 30 | 30 | 26003-6040 | 1 Each |
| 0.53 | 15 | 50 | 26003-6070 | 1 Each |
| | 30 | 50 | 26003-6100 | 1 Each |
| | 50 | 50 | 26003-1630 | 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 100q% 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 | 26004-6000 | 1 Each |
| | 30 | 10 | 26004-6030 | 1 Each |
| 0.53 | 15 | 20 | 26004-6060 | 1 Each |
| | 30 | 20 | 26004-6090 | 1 Each |

**Applications:**

- C1 to C3 isomers and alkanes up to C12
- Separation of $CO_2$, methane and $O_2/N_2/CO$
- 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 | 26005-6000 | 1 Each |
| | 30 | 10 | 26005-6030 | 1 Each |
| 0.53 | 15 | 20 | 26005-6060 | 1 Each |
| | 30 | 20 | 26005-6090 | 1 Each |

**Applications:**

- Separation of ethane, ethylene and acetylene to baseline

Learn more at **thermofisher.com/GCcolumns**

## 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 | 26006-6000 | 1 Each |
| | 30 | 10 | 26006-6030 | 1 Each |
| 0.53 | 30 | 20 | 26006-6090 | 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 | 26007-6000 | 1 Each |
| | 30 | 10 | 26007-6030 | 1 Each |
| 0.53 | 30 | 20 | 26007-6090 | 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 | 60180-862 | 1 Each |
| PLOT Particle Trap 2.5m x 0.32mm | 0.32 | 60180-860 | 1 Each |
| PLOT Particle Trap 2.5m x 0.53mm | 0.53 | 60180-861 | 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.

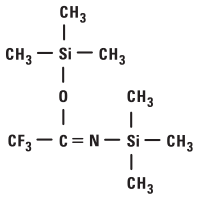
For more information visit **thermofisher.com/GCreagents**

# 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**
MW 257.4
bp 40°C/12 mm
$d_4^{20}$ 0.961

**BSTFA and BSTFA + TMCS**

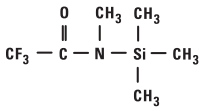
| Description | Quantity | | Cat. No. | Quantity |
|---|---|---|---|---|
| BSTFA | 10 × 1mL ampules | | TS-38830 | 1 Pack |
| | 25g | | TS-38828 | 1 Each |
| | 100g | X | TS-38829 | 1 Each |
| BSTFA + 1% TMCS | 10 × 1mL ampules | | TS-38831 | 1 Pack |
| | 10g | | TS-38832 | 1 Each |
| | 25g | | TS-38833 | 1 Each |
| | 100g | X | TS-38834 | 1 Each |
| BSTFA + 10% TMCS | 10 × 1mL ampules | | TS-38840 | 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 $Si(CH_3)_3$ 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**
MW 199.1
bp 70°C/75 mm
$d_4^{20}$ 1.11

**MSTFA and MSTFA + 1% TMCS**

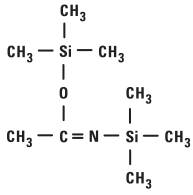
| Description | Quantity | | Cat. No. | Quantity |
|---|---|---|---|---|
| MSTFA | 10 × 1mL ampules | | TS-48910 | 1 Pack |
| | 10g | | TS-48911 | 1 Each |
| | 25mL | | TS-48913 | 1 Each |
| | 100mL | X | TS-48914 | 1 Each |
| MSTFA + 1% TMCS | 10 × 1mL ampules | | TS-48915 | 1 Pack |

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**
MW 203.4
bp 71-73°C/35 mm
$d_4^{20}$ 0.832

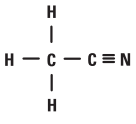
**BSA**

| Description | Quantity | Cat. No. | Quantity |
|---|---|---|---|
| BSA | 10 x 1mL | TS-38836 | 1 Pack |

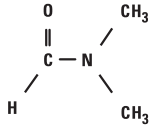
# Silylation grade solvents

Manufactured to meet your exact silylation needs

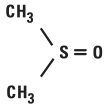
- Purified, dried and packaged under nitrogen in convenient 50mL Hypo-Vial Sample Storage Vials
- Supplied with elastomer septa, allowing immediate access to the sample without exposure to moisture and oxygen
- Use polar solvents (acetonitrile, dimethylformamide, dimethylsulfoxide, pyridine, tetrahydrofuran)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



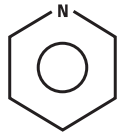
**Acetonitrile**
MW 41.05
bp 81.6°C



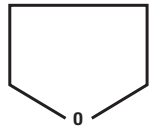
**Dimethylformamide**
MW 73.09
bp 153°C



**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 | TS-20062 | 1 Each |
| Dimethylformamide (DMF) | 50mL | X | TS-20672 | 1 Each |
| Dimethylsulfoxide (DMSO) | 50mL | X | TS-20684 | 1 Each |
| Pyridine | 50mL | X | TS-27530 | 1 Each |
| Tetrahydrofuran (THF) | 50mL | X | TS-27860 | 1 Each |

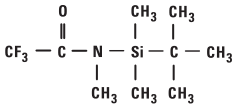
X in the ordering table indicates that hazardous shipping charges apply.

Learn more at **thermofisher.com/GCsreagents**

## 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**
MW 241.3
bp 168-170°C
$d_4^{20}$ 1.121

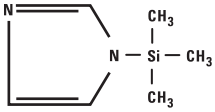
**MTBSTFA and MTBSTFA + 1% TBDMCS**

| Description | Quantity | Cat. No. | Quantity |
|---|---|---|---|
| MTBSTFA | 5mL ampules | TS-48920 | 1 Each |
| MTBSTFA + 1% TBDMCS | 10 × 1mL | TS-48927 | 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**
MW 140.26
bp 99°C/14 mm Hg
$d_4^{20}$ 0.957

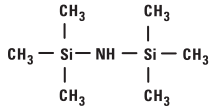
**TMSI**

| Description | Quantity | Cat. No. | Quantity |
|---|---|---|---|
| TMSI (N-Trimethylsilylimidazole) | 10 × 1mL ampules | TS-88623 | 1 Pack |
| | 25g | TS-88625 | 1 Each |
| | 100g | TS-88626 | 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
$n_d^{20}$ 1.4071

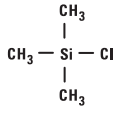
**HMDS**

| Description | Quantity | Cat. No. | Quantity |
|---|---|---|---|
| HMDS (Hexamethyldisilazane) | 25g | **TS-84770** | 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**
**$d_4^{20}$ 0.858**

**TMCS**

| Description | Quantity | Cat. No. | Quantity |
|---|---|---|---|
| TMCS | 25g | TS-88530 | 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 | TS-45950 | 1 Each |

Learn more at **thermofisher.com/GCsreagents**

## 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 | | TS-48999 | 1 Pack |
| Tri-Sil HTP Reagent HMDS:TMCS:Pyridine (2:1:10) | 50mL | X | TS-49001 | 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 from 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 | TS-49012 | 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 | TS-49016 | 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 | TS-49230 | 1 Pack |
| Tri-Sil TP Reagent TMSI: Pyridine (1:4) | 25mL | TS-49231 | 1 Each |

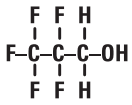
Learn more at **thermofisher.com/GCsreagents**

# 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
$d_4^{20}$ 1.2880

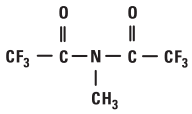
**Pentafluoropropanol**

| Description | Quantity | Cat. No. | Quantity |
|---|---|---|---|
| Pentafluoropropanol | 10 x 1mL ampules | TS-65195 | 1 Pack |

## MBTFA

For trifluoroacylating 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
$d_4^{20}$ 1.55

**MBTFA**

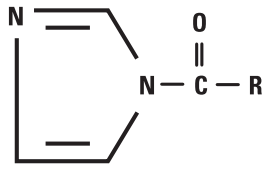
| Description | Quantity | | Cat. No. | Quantity |
|---|---|---|---|---|
| MBTFA [N-Methyl-bis(trifluoroacetamide) | 10 × 1mL ampules | | TS-49700 | 1 Pack |
| | 25mL | | TS-49703 | 1 Each |
| | 100mL | X | TS-49704 | 1 Each |
| | 5g | | TS-49701 | 1 Each |

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 |
|---|---|---|---|
| $C_3F_7$ | HFBI | 264.10 | 57 to 58°C/10mm |
| $CF_3$ | TFAI | 164.08 | 38 to 40°C/14mm |

**Perfluoroacylimidazoles (HFBI and TFAI)**

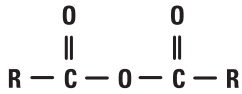
| Description | Quantity | | Cat. No. | Quantity |
|---|---|---|---|---|
| HFBI | 5g | ❄ | TS-44211 | 1 Each |
| TFAI | 10 x 1mL ampules | | TS-48882 | 1 Pack |

❄ 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 | TS-67363 | 1 Each |
| PFAA (Pentafluoropropionic Acid Anhydride) | 10 × 1mL ampules | | TS-65193 | 1 Pack |
| PFAA | 25g | X | TS-65192 | 1 Each |
| PFAA | 100g | X | TS-65191 | 1 Each |
| HFAA (Heptafluorobutyric Acid Anhydride) | 10 × 1mL ampules | | TS-63164 | 1 Pack |
| HFAA | 25g | X | TS-63163 | 1 Each |
| HFAA | 100g | X | TS-63162 | 1 Each |

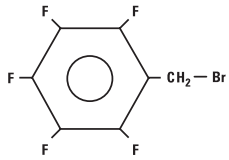
X in the ordering table indicates that hazardous shipping charges apply.

# Alkylation reagents

## 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



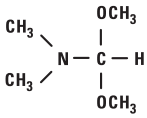

**PFBBr**
MW 260.9
bp 174-175°C
$d_4^{20}$ 1.86

## 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
$d_4^{20}$ 0.897

**Methylate reagent**

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



## MethElute reagent (TMPAH)

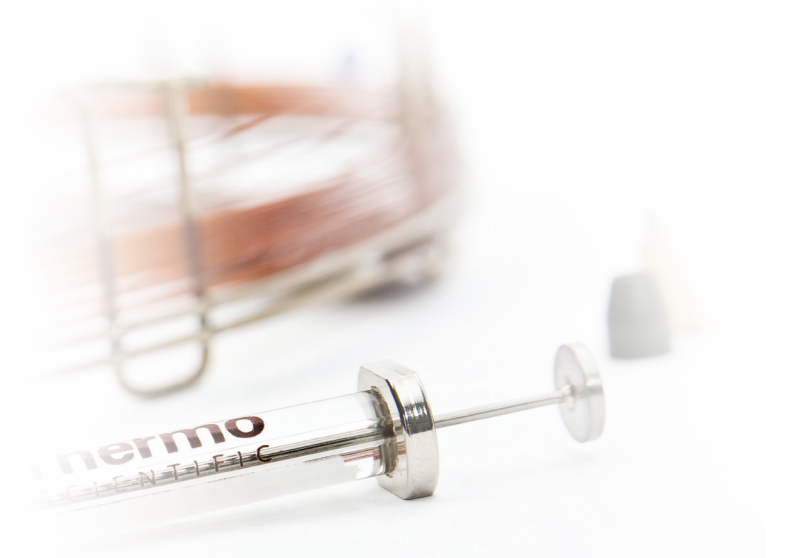
Provides accurate sensitive on-column methylation

- 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 phenobarbitol 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 | TS-49300 | 1 Each |
| MethElute Reagent (TMPAH) | 12 × 1mL ampules | TS-49301 | 1 Pack |

Learn more at **thermofisher.com/GCsreagents**



# Siliconizing fluids

## Water-soluble siliconizing fuid

Attaches the silane polymer, octadecyltrialkosilane, 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 | TS-42799 | 1 Each |

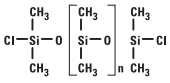
X in the ordering table indicates that hazardous shipping charges apply.

## 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 tightlyCbonded 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 | TS-42800 | 1 Each |
| Siliconizing Fluid-Hydrocarbon Soluble | 480mL | X | TS-42801 | 1 Each |

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

# 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

**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

### Thermo Scientific™ Reacti-Therm™ Heating Modules

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

### Reacti-Therm heating and stirring modules

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




## 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

**Applications:**

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

### Thermo Scientific™ Reacti-Vap™ Evaporators

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

### Gas regulators

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

# Reacti-Block aluminum blocks

Optimal thermal conductivity

- Constructed of an aluminum alloy for optimal thermal conductivity
- Each Thermo Scientific™ 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



**Thermo Scientific™ Reacti-Block™ aluminum llocks**

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

| Description | | Cat. No |
|---|---|---|
| Reacti-Block F<br>Holds 8 x 6mL Vacuum Hydrolysis Tubes; 8 holes/10mm dia. x 64mm deep | | TS-18806 |
| Reacti-Block G<br>Holds 4 x 18mL Vacuum Hydrolysis Tubes; 4 holes/19mm dia. x 64mm deep | | TS-18807 |
| Reacti-Block J<br>Blank/no holes (for custom drilling) 7.6cm tall | | TS-18809 |
| Reacti-Block K<br>Blank/no holes (for custom drilling) 5.1cm tall | | TS-18810 |
| Reacti-Block L<br>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 Thermo Scientific™ Reacti-Therm™ Heating Modules and other laboratory equipment



**Reacti-Therm thermometers**

| Min. Temperature (°C) | Max. Temperature (°C) | Cat. No. | Quantity |
|---|---|---|---|
| 0 | 100 | TS-18914 | 1 Each |
| 0 | 200 | TS-18915 | 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) | TS-18782 | 9 Pack |
| Reacti-Vap PTFE-Coated Needles 102mm (4in) Length | TS-18784 | 9 Pack |
| Reacti-Vap PTFE-Coated Needles 152mm (6in) Length | TS-18786 | 9 Pack |
| Replacement Luer-Lok Fitting | TS-18827 | 1 Each |
| Replacement Height Adjustment Knob | TS-18829 | 1 Each |
| Replacement Metal Rod | TS-18831 | 1 Each |

## 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 | TS-29570 | 1 Each |
| 6 | 10 | 150 | TS-29571 | 1 Each |
| 18 | 19 | 100 | TS-29572 | 1 Each |

Learn more at **thermofisher.com/GCsamplehandling**

## 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 fc observing chemical reactions
- Amber vials available for light-sensitive compounds
- Supplied complete with Open-Top Screw Caps and PTFE/Rubber Dis



**Thermo Scientific™ Reacti-Vial™ small reaction vials**

| Capacity | Cat. No. | Quantity |
|---|---|---|
| **Amber** | | |
| 1mL | TS-13097 | 12 Pack |
| 5mL | TS-13099 | 12 Pack |
| **Clear** | | |
| 100µL | TS-13100 | 12 Pack |
| 300µL | TS-13220 | 12 Pack |
| 1mL | TS-13221 | 12 Pack |
| 3mL | TS-13222 | 12 Pack |
| 5mL | TS-13223 | 12 Pack |
| 10mL | TS-13225 | 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 | TS-12708 | 72 Pack |
| 12 | 0.3 and 1mL Reacti-Vial Small Reaction Vials, 3.5mL Screw Cap Septum Vials | TS-12712 | 72 Pack |
| 13 | 7mL Screw Cap Septum Vials | TS-12713 | 72 Pack |
| 16 | 14mL Screw Cap Septum Vials; 15mL (0.5 oz.) Screw Cap Bottles | TS-12716 | 72 Pack |
| 18 | 3 and 5mL Reacti-Vial Small Reaction Vials | TS-12718 | 72 Pack |
| 22 | 25 and 40mL Screw Cap Septum Vials, 240mL (8 oz.) Screw Cap Bottles, 10mL Reacti-Vial | TS-12722 | 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 | TS-12412 | 72 Pack |
| 18 | 3 and 5mL Reacti-Vial Small Reaction Vials; 10 and 25mL Reacti-Flask | TS-12418 | 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 | TS-13218 | 72 Pack |
| 0.3 and 1.0mL Reacti-Vials, 3.5mL Screw Cap Septum Vial | TS-13215 | 72 Pack |
| 10mL Reacti-Vials, 40mL Screw Cap Septum Vials | TS-13219 | 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 |
|---|---|---|
| **Clear** | | |
| 3.5 | TS-13019 | 72 Pack |
| 7 | TS-13028 | 72 Pack |

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

Learn more at **thermofisher.com/GCsamplehandling**

# 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 | TS-10135 | 12 Pack |
| 27 | Fits 40mL Screw Cap Septum Vials | TS-10130 | 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 **thermofisher.com/GC**

## 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 µL 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.

## 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.



*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.





## 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 **thermofisher.com/ISQ7000**



## TSQ 9000 Triple Quadrupole GC-MS/MS system

Satisfy your routine laboratory's current and future analytical needs for truly unstoppable performance with the Thermo Scientific™ TSQ™ 9000 triple quadrupole GC-MS/MS system. Deliver high sensitivity for more routine analysis. Minimize maintenance intervals with routine-grade robustness. Operate with technology, flexible method development and powerful reporting tools designed for optimal productivity. Achieve quality results on time, every time with easy-to-use routine workflows. Fully upgrade from base to advanced configurations to boost flexibility and performance when you need it.

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## 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.

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## Chromatography resource center

Our web-based resource centers provide technical support, applications, technical tips and literature to help move your separations forward.

For more information visit: **thermofisher.com/chromatography**

## Technical support

For support, please visit our website: **thermoscientific.com/chromexpert**

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