



GC columns and accessories

# Connected chromatography solutions

GC columns and accessories

# Introduction

## GC columns and accessories

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



### GC columns

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



### GC syringes

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.



### GC derivatization reagents

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



### Sample derivatization system

Heating, stirring, and evaporation in a single Thermo Scientific™ Reacti-Therm™ module, offering a complete solution for derivatization and other small-scale reactions.

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# GC products 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.



Vials/caps



Syringes/solid phase microextraction (SPME) sample preparation



Gas filters



Septa



Ferrules/nuts



Columns connectors



Thermo Scientific™ GLD Pro Gas Leak Detector



Liners



GC columns








Thermo Scientific™ GFM Pro Gas Flowmeter



## GC syringes

### Syringe selection by needle tip style

Needle tip style	Features/applications
Cone (tapered tip) 	Most versatile needle for autosampler used and resists 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™ System
Dual gauge 	Narrow gauge part suitable for megabore on-column and split/splitless injection. Wider part suitable for autosampler use.




### Syringe selection by needle gauge size

Needle gauge parameters
Gauge is a measure of the “thickness” of the needle
The higher the gauge number, the thinner the needle (i.e., a 23 gauge is thicker than a 26 gauge)
Suffix “s” (i.e., 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 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	<ul style="list-style-type: none"> <li>Typically open-ended</li> <li>Large surface area and volume</li> <li>Design to aid mixing</li> <li>Low activity</li> </ul>
Splitless 	Sample focused onto column – minimizes sample contact with reactive metal components	<ul style="list-style-type: none"> <li>Typically tapered</li> <li>Small volume to aid transfer</li> <li>Low activity</li> </ul>
PTV 	Rapid heating and cooling, fast transfer to column-used for active compounds such as pesticides and Large volume injections	<ul style="list-style-type: none"> <li>Small, to aid sample transfer</li> <li>Good thermal properties for rapid heating and cooling</li> <li>SilTek™ coating provides highly inert surface</li> </ul>

## GC ferrules

Material	Uses	Advantages	Limitations
100% graphite	Injector and GC detectors, high temperature	<ul style="list-style-type: none"> <li>Easy-to-use stable seal</li> <li>Higher temperature limit</li> <li>Can be easily removed</li> <li>Can be re-used</li> </ul>	<ul style="list-style-type: none"> <li>Not for mass spectrometer (MS) or oxygen-sensitive detectors</li> <li>Soft, easily deformed or destroyed</li> <li>Possible system contamination</li> </ul>
Vespel/graphite	Injector, MS and oxygen-sensitive detectors	<ul style="list-style-type: none"> <li>Long lifetime</li> <li>High temperature limit</li> <li>MS compatible</li> </ul>	<ul style="list-style-type: none"> <li>Cannot be re-used</li> <li>Must be re-tightened after initial temperature cycles</li> </ul>
Thermo Scientific™ SilTite™ Ferrules	Injector, MS and oxygen-sensitive detectors	<ul style="list-style-type: none"> <li>Long lifetime</li> <li>High temperature limit</li> <li>MS compatible</li> </ul>	<ul style="list-style-type: none"> <li>Cannot be re-used</li> </ul>

## 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 (i.e., ideal for highly volatile compounds). The thinner the film, the sharper the peaks and lower the bleed.
Stationary phase chemistry			✓	Altering the stationary phase can affect elution order and help separate closely, or co-eluting peaks

## Vials and closures

Nature of sample	Vial type recommended
Routine samples	Clear glass (with or without patch) as Thermo Scientific™ SureStop™ 9 mm Screw Thread or 11 mm Crimp Vial
Light sensitive samples	Amber glass (with or without patch) as SureStop 9 mm screw thread or 11 mm 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	Thermo Scientific™ SureSTART™ MSCERT Screw Vial and Cap 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

# Gas management

Carrier gas of GC or gas chromatography mass spectrometry (GC-MS) should contain less than 1 ppm of oxygen, moisture, or other trace contaminants, to prevent column degradation, increase column lifetime, and decrease stationary phase bleed.

Detector gases also should be free of water, contaminant, or hydrocarbons to avoid baseline fluctuations and ghost peaks. Gas filters can remove moisture, oxygen and hydrocarbons from gas sources, thereby improving sensitivity and accuracy and reducing instrument maintenance.

## Gas filter selection guide

Technique	Used for	Filter	Number of connector (Click-On inline filter) or baseplate (Super Clean filter)	Benefit
GCMS	Carrier	1× triple-moisture/oxygen/hydrocarbons (Helium preconditioned for fast replacement when using helium as carrier gas)	1	
GC-FID	Carrier	1× triple-moisture/oxygen/hydrocarbons		<ul style="list-style-type: none"> <li>• Increase lifetime of column and liner</li> <li>• Higher sensitivity and data accuracy</li> <li>• Less maintenance</li> </ul>
	Detector	Option A: 2× hydrocarbon or 2× combi-hydrocarbon/moisture Option B: 3× hydrocarbon or 3× combi-hydrocarbon/moisture	3 (Option A) 4 (Option B)	
GC-ECD	Carrier	1× triple or 1 x combi moisture/oxygen	2	
	Detector	1× combi moisture/oxygen		
GC-TCD	Carrier	1× triple for both carrier gas and detector	1	
	Detector			
GC-NPD	Carrier	1× triple or 1× combi moisture/oxygen	3	
	Detector	2× hydrocarbon or 2× combi-hydrocarbon/moisture		
GC-FPD (PFPD)	Carrier	1× triple or 1× combi moisture/oxygen	3	
	Detector	2× hydrocarbon or 2× combi-hydrocarbon/moisture		



Filter type	For gas	Indicator change	Filter capacity		
			Click-On inline filter	Click-On inline filter Big Triple filter	Super Clean filter
Moisture filter	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR, Air	–	21 g H <sub>2</sub> O	–	7.2 g H <sub>2</sub> O
Oxygen filter	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR	–	450 mL O <sub>2</sub>	–	150 mL O <sub>2</sub>
Hydrocarbon filter	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR, Air	–	36 g (as n-butane)	–	12 g (as n-butane)
Combi filter – moisture, oxygen	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR	–	10 g H <sub>2</sub> O, 225 mL O <sub>2</sub>	–	–
Combi filter – moisture, hydrocarbons	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR, Air	–	10 g H <sub>2</sub> O, 18 g HCs (as n-butane)	–	3.5 g H <sub>2</sub> O, 6 g HCs (as n-butane)
Triple filter – moisture, oxygen, hydrocarbons	Inert carrier, He, H <sub>2</sub> , N <sub>2</sub> , AR	–	6 g H <sub>2</sub> O, 150 mL O <sub>2</sub> , 12 g HCs (as n-butane)	35 g H <sub>2</sub> O, 1000 mL O <sub>2</sub> , 60 g HCs (as n-butane)	1.8 g H <sub>2</sub> O, 75 mL O <sub>2</sub> , 4 g HCs (as n-butane)
Triple filter – moisture, oxygen, hydrocarbons – He preconditioned for GC/MS	He	–	6 g H <sub>2</sub> O, 150 mL O <sub>2</sub> , 12 g HCs (as n-butane)	–	1.8 g H <sub>2</sub> O, 75 mL O <sub>2</sub> , 4 g HCs (as n-butane)
Indicating triple filter – moisture, oxygen, hydrocarbons – He preconditioned for GC/MS	He	Moisture: yellow to clear Oxygen: green to gray	0.1 g H <sub>2</sub> O, 100 mL O <sub>2</sub> , 0.07 g HCs (as n-butane)	–	–

## Thermo Scientific™ Click-On™ Inline Gas 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 25 L/min



## Click-On inline gas filters (continued)



### Click-On inline gas filters

Filter type	Quantity	Cat. no.
Moisture filter	Each	<a href="#">60180-801</a>
Oxygen filter	Each	<a href="#">60180-802</a>
Hydrocarbon filter	Each	<a href="#">60180-803</a>
Combi filter – moisture, oxygen	Each	<a href="#">60180-804</a>
Combi filter – moisture, hydrocarbons	Each	<a href="#">60180-843</a>
Triple filter – moisture, oxygen, hydrocarbons	Each	<a href="#">60180-805</a>
Triple filter – moisture, oxygen, hydrocarbons – He preconditioned for GC/MS	Each	<a href="#">60180-806</a>
Indicating triple filter – moisture, oxygen, hydrocarbons – He preconditioned for GC/MS	Each	<a href="#">60180-808</a>
Big triple filter – moisture, oxygen, hydrocarbons	Each	<a href="#">60180-895</a>
Big triple filter – moisture, oxygen, hydrocarbons – N <sub>2</sub> preconditioned	Each	<a href="#">60180-895N</a>
Big triple filter kit – moisture, oxygen, hydrocarbons (including steel end fitting, 0.25 in. )	Each	<a href="#">60180-895-S4</a>

## Thermo Scientific™ Click-On™ Inline Gas Filter Connectors



### Click-On inline gas filter connectors

Description	Quantity	Cat. no.
Brass end fitting, 0.125 in.	2/pack	<a href="#">60180-809</a>
Steel end fitting, 0.125 in.	2/pack	<a href="#">60180-810</a>
Brass end fitting, 0.25 in.	2/pack	<a href="#">60180-811</a>
Steel end fitting, 0.25 in.	2/pack	<a href="#">60180-812</a>
Double ended connector to connect filter to indicator	Each	<a href="#">60180-813</a>
Replacement O-rings	Each	<a href="#">60180-833</a>
Wall mounting clamp	4/pack	<a href="#">60180-834</a>

# Thermo Scientific™ Super Clean™ Gas 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 15 bar (217 psi)
- Max. flow 7 L/min



## Super Clean gas cartridge filters

Filter type	Description	Base included	Quantity	Cat. no.
Indicating cartridge filter	Moisture	No	Each	<a href="#">60180-819</a>
	Oxygen	No	Each	<a href="#">60180-820</a>
	Hydrocarbons	No	Each	<a href="#">60180-821</a>
Indicating combi filter	Moisture, hydrocarbons	No	Each	<a href="#">60180-826</a>
Indicating triple filter	Moisture, oxygen, hydrocarbons	No	Each	<a href="#">60180-824</a>
		Yes	Each	<a href="#">60180-830</a>
	Moisture, oxygen, hydrocarbons, He preconditioned for GC-MS	No	Each	<a href="#">60180-825</a>
3 cartridge filter pack	1 x triple filter and 2 x combi filter (moisture, hydrocarbons)	Yes	Each	<a href="#">60180-829</a>
		No	Each	<a href="#">60180-822</a>
4 cartridge filter pack	1 x moisture filter, 1 x O <sub>2</sub> filter, 2 x hydrocarbon filter	Yes	Each	<a href="#">60180-828</a>
		No	Each	<a href="#">60180-827</a>

# Thermo Scientific™ Super Clean™ Gas 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



## Specifications

Filter baseplate type	For use with	Technique
Single base	1x triple filter for carrier	GC-MS, GC-TCD
Dual base	1x triple filter for carrier, 1x combi filter for detector	GC-ECD
Triple base	1x triple and 2x combi filter	GC-FPD, GC-FID, GC-NPD
Four-position base	1x triple, 3x hydrocarbon	GC-FID

## Super Clean gas cartridge filter baseplates

Filter baseplate type	Quantity	Cat. no.
Single base	Each	<a href="#">60180-814</a>
Dual base	Each	<a href="#">60180-815</a>
Triple base	Each	<a href="#">60180-817</a>
Four-position base	Each	<a href="#">60180-818</a>
O-rings for base plates	20 pack	<a href="#">60180-837</a>
Flush cap	2/pack	<a href="#">60180-838</a>
Universal ring nut for Super Clean filter	Each	<a href="#">60180-845</a>
Connector Set - 1/8" brass, 3 sets of two connectors (in- and outlet) for base plate	3/pack	<a href="#">60180-852</a>
Connector Set - 1/4" brass, 3 sets of two connectors (in- and outlet) for base plate	3/pack	<a href="#">60180-851</a>
Connector Set - 1/4" SS, 3 sets of two connectors (in- and outlet) for base plate	3/pack	<a href="#">60180-853</a>
Connector Set - 1/8" SS, 3 sets of two connectors (in- and outlet) for base plate	3/pack	<a href="#">60180-854</a>

# Syringes for GC

## Providing durability, clarity and accuracy for your sample

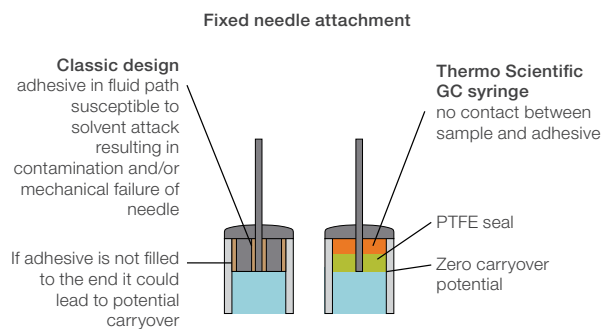
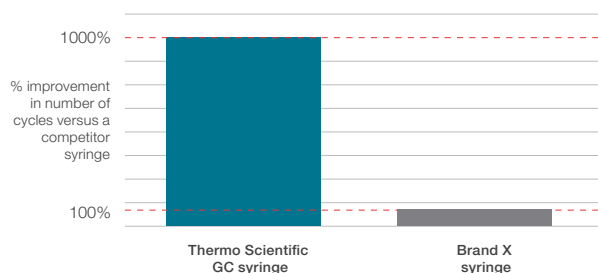
Thermo Scientific syringes for GC instruments are designed to provide enhanced durability, clarity and accuracy in sample introduction. This gives confidence in analytical results, time-after-time.

Thermo Scientific™ SMART consumables for Thermo Scientific™ TriPlus™ RSH SMART Autosampler include syringes, and solvent-free solid phase microextraction (SPME) Arrow fibers and SPME fibers.

Learn more at

[thermofisher.com/smartchromatographsyringe](http://thermofisher.com/smartchromatographsyringe)

[thermofisher.com/gcparts](http://thermofisher.com/gcparts)



## 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.

## Traceability in your GC syringe

Each Thermo Scientific SMART syringe contains an ID chip which communicates with the TriPlus RSH SMART autosampler. Important parameters such as part number, lot number, usage parameters, ranges, and history for each SMART syringe are available through Thermo Scientific™ Chromeleon™ Chromatography Data System (CDS) software records in the audit trail log file.

## Accuracy in your GC syringe

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

- 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.

## SMART syringes for TriPlus RSH SMART autosampler

Thermo Scientific™ SMART Syringes for liquid syringe tool 1R77010-1007 or D7/57						
Syringe volume (µL)	Needle length (mm)	Gauge	Needle type	Gas tight	For use with	Cat. no.
0.5	57	23	Cone	No	Microvolume injections of highly concentrated samples or Fast GC applications with narrow bore columns	<a href="#">365A0241-SM</a>
1	57	23	Cone	No	Microvolume injections of highly concentrated samples or Fast GC applications with narrow bore columns	<a href="#">365B0251-SM</a>
5	57	23s	Cone	No	PTV all injection modes, or SSL all injection modes, or injector with Merlin adaptor	<a href="#">365C0231-SM</a>
5	57	26s	Cone	No	PTV all injection modes, or SSL all injection modes	<a href="#">365C0251-SM</a>
10	57	23s	Cone	No	PTV all injection modes, or SSL all injection modes, or injector with Merlin adaptor	<a href="#">365D0271-SM</a>
10	57	26s	Cone	No	PTV all injection modes, or SSL all injection modes	<a href="#">365D0291-SM</a>
10	57	26s	Bevel	No	PTV injection with empty straight liner (requires PTV liner cap PN 29004014), suggested for polar solvents	<a href="#">365D0391-SM</a>
10	57	23s	Cone	Yes	PTV all injection modes, or SSL all injection modes, or injector with Merlin adaptor. Particularly suitable for volatile solvents or corrosive samples	<a href="#">365D0311-SM</a>
10	57	26s	Cone	Yes	PTV all injection modes, or SSL all injection modes. Particularly suitable for volatile solvents or corrosive samples	<a href="#">365D0331-SM</a>
25	57	23s	Cone	Yes	PTV all injection modes, or SSL all injection modes, or injector with Merlin adaptor	<a href="#">365F2441-SM</a>
25	57	26s	Cone	Yes	PTV all injection modes, or SSL all injection modes	<a href="#">365F2461-SM</a>
50	57	23s	Cone	Yes	Large volume splitless with SSL, or PTV, or injector with Merlin adaptor	<a href="#">365G2311-SM</a>
50	57	26s	Cone	Yes	Large volume splitless with SSL or PTV	<a href="#">365G2331-SM</a>
100	57	23s	Cone	Yes	Large volume splitless with SSL, or PTV, or injector with Merlin adaptor	<a href="#">365H2141-SM</a>
100	57	26s	Cone	Yes	Large volume splitless with SSL or PTV	<a href="#">365H2161-SM</a>
100	57	23	Side hole	Yes	Large volume PTV with and without Merlin adaptor	<a href="#">365H2181-SM</a>

Note: SMART syringes are compatible with all TriPlus RSH autosamplers, as well as PAL platforms and AOC-6000 Series autosamplers



**Download fully-traceable GC injections user guide**  
with Thermo Scientific SMART consumables for  
Thermo Scientific TriPlus RSH SMART autosampler

## SMART syringes for TriPlus RSH SMART autosampler (continued)

SMART Syringes for liquid syringe tool 1R77010-1008 or D7/85						
Syringe volume (µL)	Needle length (mm)	Gauge	Needle type	Gas tight	For use with	Cat. no.
5	85	23s	Cone	No	SSL on Trace Ultra, TSI, or injector with Merlin adaptor	<a href="#">365C0221-SM</a>
5	85	26s	Cone	No	On-column injection, SSL on Trace Ultra, or TSI	<a href="#">365C0241-SM</a>
10	85	23s	Cone	No	SSL on Trace Ultra, TSI, or injector with Merlin adaptor	<a href="#">365D0261-SM</a>
10	85	26s	Cone	No	On-column injection, SSL on Trace Ultra, or TSI	<a href="#">365D0281-SM</a>
10	85	23s	Cone	Yes	SSL on Trace Ultra, TSI, or injector with Merlin adaptor. Particularly suitable for volatile solvents or corrosive samples	<a href="#">365D0301-SM</a>
10	85	26s	Cone	Yes	On-column injection, SSL on Trace Ultra, or TSI. Particularly suitable for volatile solvents or corrosive samples	<a href="#">365D0321-SM</a>
25	85	26s	Cone	Yes	On-column injection, SSL on Trace Ultra, or TSI	<a href="#">365F2451-SM</a>
50	85	26s	Cone	Yes	Large volume on-column injection	<a href="#">365G2321-SM</a>
100	85	26s	Cone	Yes	Large volume on-column injection	<a href="#">365H2151-SM</a>
100	85	23	Side hole	Yes	Large volume PTV with and without Merlin adaptor	<a href="#">365H2171-SM</a>

SMART Syringes for liquid syringe tool 1R77010-1009 or D8/57						
Syringe volume (µL)	Needle length (mm)	Gauge	Needle type	Gas tight	For use with	Cat. no.
250	57	26	Cone	Yes	Large volume splitless with SSL without Merlin adaptor	<a href="#">365I2331-SM</a>
250	57	23	Side hole	Yes	Large volume PTV with and without Merlin adaptor	<a href="#">365I2351-SM</a>
500	57	26	Cone	Yes	Large volume splitless with SSL without Merlin adaptor, Sample preparation (i.e., dilutions, calibrations)	<a href="#">365J2421-SM</a>
500	57	23	Side hole	Yes	Large volume PTV with and without Merlin adaptor	<a href="#">365J2441-SM</a>
1000	57	22	LC	Yes	Sample preparation (i.e., dilution, derivatization, liquid-liquid extraction, micro-SPE)	<a href="#">365K2811-SM</a>

SMART Syringes for liquid syringe tool 1R77010-1010 or D8/85						
Syringe volume (µL)	Needle length (mm)	Gauge	Needle type	Gas tight	For use with	Cat. no.
250	85	26	Cone	Yes	Large volume on-column injection	<a href="#">365I2321-SM</a>
250	85	23	Side hole	Yes	Variable depth large volume PTV with and without Merlin adaptor	<a href="#">365I2341-SM</a>
500	85	26	Cone	Yes	Large volume on-column injection	<a href="#">365J2411-SM</a>

SMART Syringes for liquid syringe tool 1R77010-1011 or D18/57						
Syringe volume (µL)	Needle length (mm)	Gauge	Needle type	Gas tight	For use with	Cat. no.
10000	57	19	LC	Yes	Sample preparation (i.e., sample dilution, derivatization, liquid-liquid extraction)	<a href="#">365N2721-SM</a>

## SMART syringes for TriPlus RSH SMART autosampler (continued)

### SMART Syringes for headspace tool 1R77010-1012 or HS1000

Syringe volume (µL)	Needle length (mm)	Gauge	Needle type	Gas tight	For use with	Cat. no.
1000	65	23	Side hole	Yes	Headspace	<a href="#">365K2871-SM</a>

### SMART Syringes for headspace tool 1R77010-1013 or HS2500

Syringe volume (µL)	Needle length (mm)	Gauge	Needle type	Gas tight	For use with	Cat. no.
2500	65	23	Side hole	Yes	Headspace	<a href="#">365L2321-SM</a>

### SMART Syringes for headspace tool 1R77010-1014 or HS5000

Syringe volume (µL)	Needle length (mm)	Gauge	Needle type	Gas tight	For use with	Cat. no.
5000	65	23	Side hole	Yes	Headspace	<a href="#">365M2331-SM</a>



**Download fully-traceable GC injections user guide**  
with Thermo Scientific SMART consumables for  
Thermo Scientific TriPlus RSH SMART autosampler



## SMART SPME for TriPlus RSH SMART autosampler

SMART SPME Arrow Fibers					
Phase	Outer diameter (mm)	Phase thickness (µm)	Color code	Cat. no. (pack of 1)	Cat. no. (pack of 3)
PDMS	1.1	100	Red	<a href="#">36SA10P1-SM</a>	<a href="#">36SA10P3-SM</a>
PDMS	1.5	250	Black	<a href="#">36SA25P1-SM</a>	<a href="#">36SA25P3-SM</a>
Polyacrylate	1.1	100	Gray	<a href="#">36SA10A1-SM</a>	<a href="#">36SA10A3-SM</a>
Carbon WR/PDMS	1.1	120	Light blue	<a href="#">36SA12B1-SM</a>	<a href="#">36SA12B3-SM</a>
DVB/PDMS	1.1	120	Violet	<a href="#">36SA12E1-SM</a>	<a href="#">36SA12E3-SM</a>
DVB/carbon WR/PDMS	1.1	120	Dark grey	<a href="#">36SA11T1-SM</a>	<a href="#">36SA11T3-SM</a>
Collection of five different SMART SPME arrow fibers: PDMS-red, polyacrylate-grey, carbon WR/PDMS-light blue, DVB/PDMS-violet, DVB/carbon WR/PDMS-dark grey				<a href="#">36SA10M5-SM</a>	

### Notes:

- SMART SPME Arrow fibers are compatible with all TriPlus RSH autosamplers, as well as PAL platforms and AOC-6000 series autosamplers
- For instructions on use, care, and maintenance of SMART SPME Arrow fibers, please refer to the user guide

SMART SPME Fibers					
Phase	Outer diameter (mm)	Phase thickness (µm)	Color code	Cat. no. (pack of 1)	Cat. no. (pack of 3)
PDMS	0.6	7	Green	<a href="#">36SP01P1-SM</a>	<a href="#">36SP01P3-SM</a>
PDMS	0.6	30	Golden	<a href="#">36SP03P1-SM</a>	<a href="#">36SP03P3-SM</a>
PDMS	0.6	100	Red	<a href="#">36SP10P1-SM</a>	<a href="#">36SP10P3-SM</a>
Acrylate	0.6	85	Gray	<a href="#">36SP08A1-SM</a>	<a href="#">36SP08A3-SM</a>
Carbon WR/PDMS	0.6	95	Dark blue	<a href="#">36SP09C1-SM</a>	<a href="#">36SP09C3-SM</a>
DVB/carbon WR/PDMS	0.6	50/30	Dark grey	<a href="#">36SP05T1-SM</a>	<a href="#">36SP05T3-SM</a>
DVB/PDMS	0.6	65	Violet	<a href="#">36SP06E1-SM</a>	<a href="#">36SP06E3-SM</a>
Collection of five different SMART SPME fibers: PDMS-red, acrylate-grey, carbon WR/PDMS-dark blue, DVB/PDMS-violet, DVB/carbon WR/PDMS-dark grey				<a href="#">36SP08M5-SM</a>	

### Notes:

- All SMART SPME fibers have a standard length of 10 mm and a 23-gauge needle
- SMART SPME fibers are compatible with all TriPlus RSH autosamplers as well as PAL platforms and AOC-6000 series autosamplers
- For instructions on use, care, and maintenance of SMART SPME fibers, please refer to the user guide



Download [fully-traceable GC injections user guide](#) with Thermo Scientific SMART consumables for Thermo Scientific TriPlus RSH SMART autosampler

## GC syringes for TriPlus RSH autosampler

### Thermo Scientific™ Removable-Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Type	Quantity	Cat. no.
0.5	57	23	Cone	Split	Each	365A0241*
1	57	23	Cone	Split	Each	<a href="#">365B0251</a> *

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

### Thermo Scientific™ Fixed-Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Type	Quantity	Cat. no.
5	85	23s	Cone	Merlin valve SSL injector: splitless	Each	365C0221
	57	23s	Cone	SSL, PTV and Merlin adapter	Each	365C0231*
	85	26s	Cone	Splitless and OC	Each	<a href="#">365C0241</a>
	57	26s	Cone	SSL and PTV	Each	<a href="#">365C0251</a> *
10	85	23s	Cone	Merlin valve SSL injector: splitless	Each	365D0261
	57	23s	Cone	SSL, PTV and Merlin adapter	Each	<a href="#">365D0271</a> *
	85	26s	Cone	Splitless and OC	Each	365D0281
	57	26s	Cone	SSL and PTV	Each	<a href="#">365D0291</a> *

\* Also suitable for use with the TriPlus 100 LS liquid autosampler

## GC syringes for TriPlus RSH autosampler (continued)

### Thermo Scientific™ Fixed-Needle, Gas-Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Type	Quantity	Cat. no.
10	85	23s	Cone	Merlin valve SSL injector: splitless	Each	365D0301
	57	23s	Cone	SSL, PTV and Merlin adapter, especially suitable for volatile solvents or corrosive samples	Each	365D0311*
	85	26s	Cone	Splitless and OC	Each	365D0321
	57	26s	Cone	SSL, PTV and Merlin adapter, especially suitable for volatile solvents or corrosive samples	Each	<a href="#">365D0331*</a>
25	57	23s	Cone	SSL, PTV and Merlin adapter	Each	365F2441*
	57	26s	Cone	SSL and PTV	Each	365F2461*
50	57	23s	Cone	Large volume injection, SSL	Each	365G2311*
	85	26s	Cone	LV OC	Each	365G2321
100	57	23s	Cone	Large volume injection, SSL	Each	365H2141*
	85	26s	Cone	LV OC	Each	365H2151
	57	26s	Cone	Large volume injection, SSL w/o Merlin adapter	Each	<a href="#">365H2161*</a>
	85	23	Side hole	Variable depth LV PTV (with or without Merlin valve)	Each	365H2171
	57	23	Side hole	Large volume injection, PTV	Each	<a href="#">365H2181*</a>
250	85	26	Cone	LV OC	Each	365I2321
	57	26	Cone	LV splitless	Each	365I2331
	85	23	Side hole	Variable depth LV PTV (with or without Merlin valve)	Each	365I2341
	57	23	Side hole	LV PTV (with or without Merlin valve)	Each	<a href="#">365I2351</a>
500	85	26	Cone	LV OC	Each	365J2411
	57	26	Cone	Sample preparation, i.e. dilution, derivatization	Each	365J2421
	57	23	Side hole	LV PTV (with or without Merlin valve)	Each	365J2441
1000	65	23	Side hole	Headspace, up to 115 deg.	Each	365Q2121
	57	22	LC	Sample preparation, i.e. dilution, derivatization	Each	<a href="#">365K2811</a>
2500	65	23	Side hole	Headspace, up to 115 deg.	Each	<a href="#">365Q2131</a>
	65	23	Side hole	Headspace, up to 150 deg.	Each	365L2321
5000	65	22	Side hole	Headspace up to 115 deg.	Each	<a href="#">365Q2141</a>
10000	57	19	LC	Sample preparation, i.e. dilution, derivatization	Each	365N2721

\* Also suitable for use with the TriPlus 100 LS liquid autosampler

## GC syringes for Thermo Scientific instruments

### Thermo Scientific™ Removable-Needle and Replacement-Needle, Gas-Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Type	Instrument compatibility	Quantity	Cat. no. removable-needle	Quantity	Cat. no. replacement needle
10	75	31	Cone	Manual OC	–	Each	<a href="#">36500520</a>	2/pack	<a href="#">36550046</a>
50	50	23	Cone	–	AIAS 1610	Each	<a href="#">365G1503</a>	5/pack	<a href="#">36566485</a>
100	50	23	Side hole	See note	AI/AS 1610, TriPlus, AS200/AS800	Each	<a href="#">36520050</a>	2/pack	<a href="#">36550040</a>
100	50	23	Cone	LV splitless	TriPlus, AS2000, AS200/AS800	Each	<a href="#">36500495</a>	5/pack	<a href="#">36566485</a>
250	50	23	Side hole	–	TriPlus, AS2000, AS200/AS800	Each	<a href="#">36520051</a>	2/pack	<a href="#">36550040</a>
1000	50	23	Bevel	–	AS200/AS800	Each	<a href="#">365K3041</a>	5/pack	<a href="#">365RN235</a>

Syringe PN 365G1503 is to be used with AI/AS 1610 Autosampler for SSL or PTV with the needle 36550040. Syringe PN 36520050 is to be used with AI/AS 1610 Autosampler for PTV or SSL with the needle 36566458.

### Thermo Scientific™ Removable-Needle and Replacement-Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Type	Instrument compatibility	Quantity	Cat. no. removable-needle	Quantity	Cat. no. replacement needle
10	50	26	Cone	–	AS3000, AS2000	Each	<a href="#">365D1841</a>	2/pack	<a href="#">365RN362</a>
10	50	23	Cone	–	AS3000, AS2000, AS200/AS800	Each	<a href="#">365D3731</a>	2/pack	<a href="#">365RN372</a>
50	50	23	Cone	LV splitless	AS2000	Each	<a href="#">36503015</a>	5/pack	<a href="#">36566485</a>

Syringe PN 36520051 is to be used when performing PTV/LVI injections with a dedicated liner for thermally labile compounds (liner PN 45352060). Compatible with Merlin MicroSeal device installed on best programmable temperature vaporizer (PTV) inlet and with AS2000 and TriPlus autosamplers for liquids.

## GC syringes for Thermo Scientific instruments (continued)

### Thermo Scientific™ Fixed-Needle, Gas-Tight Syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Type	Instrument compatibility	Quantity	Cat. no.
10	50	23	Cone	SSL/PTV	AS2000, AI/AS 1610, AI/AS 1310	Each	<a href="#">365D3741</a>
10	50	26	Cone	SSL/PTV	AI/AS1610	Each	<a href="#">365D2977</a>
10	50	26	Cone	SSL/PTV	AI/AS1610	6/pack	<a href="#">365D2976</a>
100	50	25	Bevel	—	AS200/AS800	Each	<a href="#">365H2321</a>
250	50	25	Bevel	—	AS200/AS800	Each	<a href="#">365I2561</a>

### Thermo Scientific fixed-needle syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Type	Instrument compatibility	Quantity	Cat. no.
5	50	26	Cone	Split/PTV	TriPlus	Each	<a href="#">36504047</a>
5	50	23	Cone	—	AS3000, AS2000, AI/AS 1610, AI/AS 1310	Each	<a href="#">365C3701</a>
5	50	26	Cone	Split/PTV	AI/AS 1610, AI/AS 1310	Each	<a href="#">36500505</a>
10	50	26	Cone	—	AS3000, AS200, AS200/AS800	Each	<a href="#">365D3711</a>
10	50	26	Cone	—	AS300, AS2000, AS200/AS800	6/pack	<a href="#">365D1856</a>
10	50	25	Cone	Split/PTV	TriPlus, AS3000, AI/AS 1610, AI/AS 1310	Each	<a href="#">36500525</a>
10	50	23	Cone	PTV/SSL split	AI/AS 1310, TriPlus, AS3000, AI/AS 1610, AS200/AS800	Each	<a href="#">36520060</a>
10	80	23	Cone	Merlin valve SSL splitless	TriPlus, AS2000	Each	<a href="#">36520061</a>
10	50	23-26	Cone	OC in PTV merlin valve	TriPlus, AS2000, AI/AS 1610	Each	<a href="#">36500580</a>
10	80	26	Cone	OC and splitless	TriPlus, AS2000	Each	<a href="#">36502019</a>

### Thermo Scientific™ Plunger-In-Needle Syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Type	Instrument compatibility	Quantity	Cat. no.
0.5	50	23	Cone	Split/PTV	AI/AS 1310, AI/AS 1610	Each	<a href="#">36504045</a>
0.5	80	26	Cone	Splitless and OC	TriPlus	Each	<a href="#">36504046</a>

## GC syringes for Agilent™ instruments

### Thermo Scientific removable-needle syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Quantity	Cat. no.
10	42	23	Cone	Each	<a href="#">365D1611</a>

### Thermo Scientific fixed-needle, gas-tight syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Quantity	Cat. no.
10	42	23-26	Cone	Each	<a href="#">365D0621</a>
		23-26	Cone	6/pack	365D0626
		23	Cone	Each	365D0631
		23	Cone	6/pack	365D0636

### Thermo Scientific fixed-needle syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Quantity	Cat. no.
5	42	23	Cone	Each	<a href="#">365C0951</a>
		23	Cone	6/pack	<a href="#">365C0956</a>
		23-26s	Cone	Each	<a href="#">365C0971</a>
		23-26s	Cone	6/pack	<a href="#">365C0976</a>
10	42	23	Cone	Each	<a href="#">365D1571</a>
		23	Cone	6/pack	<a href="#">365D1576</a>
		23-26s	Cone	Each	<a href="#">365D1621</a>
		23-26s	Cone	6/pack	<a href="#">365D1636</a>

### Thermo Scientific™ Fixed-needle, Super-Elastic Plunger Syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Quantity	Cat. no.
10	42	23-26s	Cone	Each	365D5416

## GC syringes for Shimadzu™ instruments

### Thermo Scientific removable-needle syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Quantity	Cat. no.
5	42	26s	Cone	Each	365C6610
10	42	26s	Cone	Each	<a href="#">365D6610</a>
		23s	Cone	Each	365D6620

## GC syringes for CTC instruments

### Thermo Scientific removable-needle and replacement-needle syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Quantity	Cat. no. removable-needle	Quantity	Cat. no. replacement-needle
10	50	23	Cone	Each	<a href="#">365D3731</a>	2/pack	<a href="#">365RN372</a>
		26	Cone	Each	<a href="#">365D1841</a>	2/pack	<a href="#">365RN362</a>

### Thermo Scientific fixed-needle, gas-tight syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Quantity	Cat. no.
10	50	26	Cone	6/pack	<a href="#">365D2976</a>
		26	Cone	Each	<a href="#">365D2977</a>
		23	Cone	Each	<a href="#">365D3741</a>
25	50	23	Cone	Each	<a href="#">365F3761</a>
100	50	23	Cone	Each	<a href="#">365H3771</a>
250	50	26	Cone	Each	<a href="#">365H6700</a>
1000	50	26	Side hole	Each	<a href="#">365K8135</a>
2500	50	26	Side hole	Each	<a href="#">365L8635</a>

### Thermo Scientific fixed-needle syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Quantity	Cat. no.
5	50	23	Cone	Each	<a href="#">365C3701</a>
		26	Cone	Each	<a href="#">36500505</a>
10	50	26	Cone	Each	<a href="#">365D3711</a>
		23	Cone	Each	<a href="#">36520060</a>
		26	Cone	6/pack	<a href="#">365D1856</a>
		23	Cone	6/pack	<a href="#">365D2971</a>

## Manual GC syringes

### Thermo Scientific removable-needle and replacement-needle, gas-tight syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Quantity	Cat. no.	Quantity	Cat. no. replacement-needle
10	50	26s	Bevel	Each	<a href="#">365D0811</a>	5/pack	<a href="#">365RN215</a>
25	50	25	Bevel	Each	<a href="#">365F1931</a>	5/pack	<a href="#">365RN225</a>
50	50	22s	Blunt end	Each	<a href="#">365GLG41</a>	5/pack	–
500	50	25	Bevel	Each	<a href="#">365J2881</a>	5/pack	<a href="#">365RN225</a>
		22s	Blunt end	Each	<a href="#">365JLG71</a>	5/pack	–
1000	50	23	Bevel	Each	<a href="#">365K3041</a>	5/pack	<a href="#">365RN235</a>
5000	50	22	Bevel	Each	<a href="#">365M5212</a>	–	–
10000	50	22	Bevel	Each	<a href="#">365N5214</a>	–	–

### Thermo Scientific removable-needle syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Quantity	Cat. no.	Quantity	Cat. no. replacement-needle
10	50	26	Bevel	Each	<a href="#">365D1171</a>	5/pack	<a href="#">365RN215</a>
25	50	25	Bevel	Each	<a href="#">365F1901</a>	5/pack	<a href="#">365RN225</a>
50	50	25	Bevel	Each	<a href="#">365G2091</a>	5/pack	<a href="#">365RN225</a>

### Thermo Scientific fixed-needle, gas-tight syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Quantity	Cat. no.
10	50	26	Bevel	Each	<a href="#">365D4433</a>
		26s	Blunt end	Each	<a href="#">365D6314</a>
25	50	25	Bevel	Each	<a href="#">365F1891</a>
		22s	Blunt end	Each	<a href="#">365F6315</a>
50	50	25	Bevel	Each	<a href="#">365G2111</a>
		22s	Blunt end	Each	<a href="#">365G6316</a>
100	50	25	Bevel	Each	<a href="#">365H2321</a>
		22s	Blunt end	Each	<a href="#">365H6317</a>
250	50	25	Bevel	Each	<a href="#">365I2561</a>
500	50	25	Bevel	Each	<a href="#">365J2831</a>
		22s	Blunt end	Each	<a href="#">365J6319</a>
	55	22	Flat/LC	Each	<a href="#">365JL720</a>
1000	50	22	Bevel	Each	<a href="#">365K3051</a>



## Manual GC syringes (continued)

## Thermo Scientific fixed-needle syringes

Volume (μL)	Length (mm)	Gauge	Tip style	Quantity	Cat. no.
5	50	26	Bevel	Each	<a href="#">365C0741</a>
10	50	26	Bevel	Each	<a href="#">365D1091</a>
		26	Bevel	6/pack	<a href="#">365D1096</a>
25	50	25	Bevel	Each	<a href="#">365F1891</a>
100	50	25	Bevel	Each	<a href="#">365H2291</a>

## Thermo Scientific™ PTFE Luer-Lok, gas-tight syringes

Volume (μL)	Quantity	Cat. no.	Quantity	Cat. no. needle
25	Each	<a href="#">365F7655</a>	2/pack	<a href="#">365RNL22</a>
50	Each	<a href="#">365G7656</a>	2/pack	<a href="#">365RNL22</a>
100	Each	<a href="#">365H7657</a>	2/pack	<a href="#">365RNL22</a>
250	Each	<a href="#">365I7658</a>	2/pack	<a href="#">365RNL22</a>
500	Each	<a href="#">365J7659</a>	2/pack	<a href="#">365RNL22</a>
1000	Each	<a href="#">365KL531</a>	2/pack	<a href="#">365RNL22</a>

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

## Thermo Scientific™ Luer-Tip, gas-tight syringes

Volume (μL)	Quantity	Cat. no.	Quantity	Cat. no. needle
100	Each	<a href="#">365H7814</a>	2/pack	<a href="#">365RNL22</a>
1000	Each	<a href="#">365K7817</a>	2/pack	<a href="#">365RNL22</a>
2500	Each	<a href="#">365L7818</a>	2/pack	<a href="#">365RNL22</a>
5000	Each	<a href="#">365M7819</a>	2/pack	<a href="#">365RNL22</a>
10000	Each	<a href="#">365N7820</a>	2/pack	<a href="#">365RNL22</a>



# Injection port septa

## Septa

Quality materials for all applications

Learn more at

[thermofisher.com/gcparts](http://thermofisher.com/gcparts)



### BTO septa

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

### TR-Green septa

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

### Marathon septa

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

### TR-Blue septa

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

### Thermo Scientific™ Septa

Material	ID (mm)	Quantity (Blister pack)	Cat. no. (Blister pack)	Quantity (Glass jar)	Cat. no. (Glass jar)
BTO	9	50/pack	<a href="#">31303240-BP</a>	50/pack	<a href="#">31303240</a>
BTO	11*	50/pack	<a href="#">31303233-BP</a>	50/pack	<a href="#">31303233</a>
BTO	11.5	50/pack	<a href="#">31303230-BP</a>	50/pack	<a href="#">31303230</a>
BTO	12.7	48/pack	<a href="#">31303250-BP</a>	50/pack	<a href="#">31303228</a>
BTO	17	48/pack	<a href="#">31303215-BP</a>	50/pack	<a href="#">31303211</a>
TR-Green	9	50/pack	<a href="#">313G3240-BP</a>	50/pack	<a href="#">313G3240</a>
TR-Green	11*	50/pack	<a href="#">313G3230-BP</a>	50/pack	<a href="#">313G3230</a>
TR-Green	12.7	48/pack	–	50/pack	<a href="#">313G3228</a>
TR-Green	17	48/pack	<a href="#">313G3215-BP</a>	50/pack	<a href="#">313G3211</a>
Marathon	9	50/pack	<a href="#">313P3240-BP</a>	50/pack	<a href="#">313P3240</a>
Marathon	11*	50/pack	<a href="#">313P3233-BP</a>	50/pack	<a href="#">313P3233</a>
Marathon	17	48/pack	<a href="#">313P3215-BP</a>	50/pack	<a href="#">313P3211</a>
TR-Blue	9	–	–	50/pack	<a href="#">313B3240</a>
TR-Blue	11*	–	–	50/pack	<a href="#">313B3233</a>
High temperature	Plug type**	–	–	25/pack	<a href="#">HT-SP</a>
Long life	Plug type**	–	–	25/pack	<a href="#">LL-SP</a>

Notes:

\* 11 mm ID septa are compatible with Thermo Scientific 1300, 1600 Series and Agilent 5890, 6890, 7890 GC systems.

\*\* Plug type septa are compatible with Shimadzu GC systems.

## Thermo Scientific™ Gold and SilTek™ Inlet Base Seals

- Precision machined to provide exceptional sealing properties
- Gold plating and SilTek coating provides a surface with exceptional inertness for analysis of highly active compounds
- High grade stainless steel providing reproducible seal
- Compatible with Thermo Scientific™ TRACE™ 1300 and 1600 Series GC systems and Agilent split/splitless injection ports
- Not compatible when Thermo Scientific™ HeSaver-H<sub>2</sub>Safer™ kit is installed



### Thermo Scientific Gold inlet base seals

For use with	ID (mm)	Quantity	Cat. no.
Single column installation	0.8	10/pack	<a href="#">290GA081</a>
	0.8	2/pack	<a href="#">290GA082</a>
Single column installation (cross version)	0.8	10/pack	<a href="#">290GA084</a>
	0.8	2/pack	<a href="#">290GA083</a>
Dual column installation	1.2	2/pack	<a href="#">290GA122</a>



### Thermo Scientific SilTek inlet base seals

For use with	ID (mm)	Quantity	Cat. no.
Single column installation	0.8	10/pack	<a href="#">290GA091</a>
	0.8	2/pack	<a href="#">290GA092</a>
Single column installation (cross version)	0.8	10/pack	<a href="#">290GA094</a>

# Injection port liners

## Thermo Scientific™ LinerGOLD™ GC Liners

The GOLD standard in GC liner performance

Learn more at

[thermofisher.com/gcparts](http://thermofisher.com/gcparts)

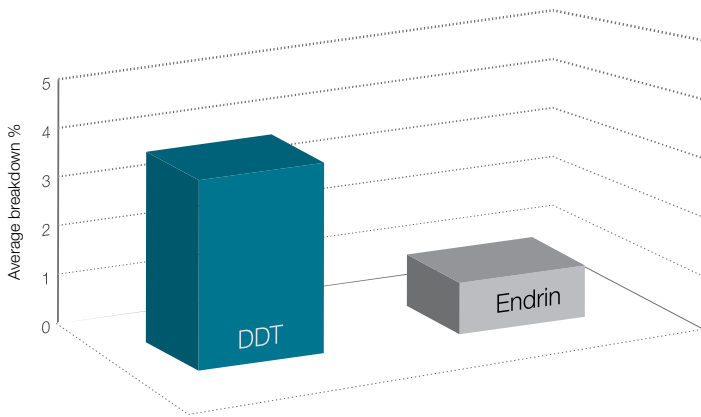


Figure 1: Endrin and DDT breakdown test results showing the lot-to-lot reproducibility and low levels of inertness of LinerGOLD GC liners

- **Increased accuracy and sensitivity in analysis** – LinerGOLD GC liners prevent 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. LinerGOLD GC liners are manufactured and tested to ensure that you have confidence with every liner that it installed onto your GC system.

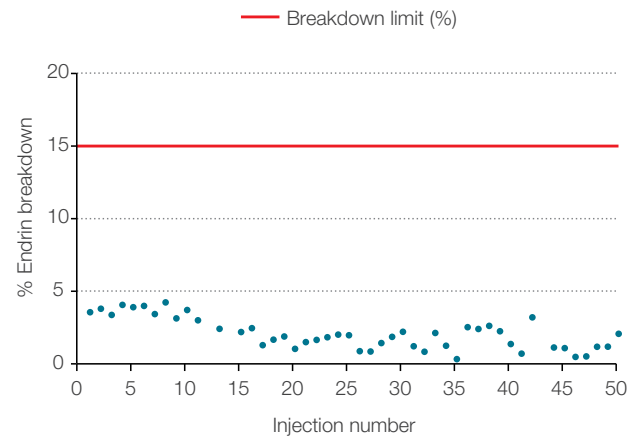
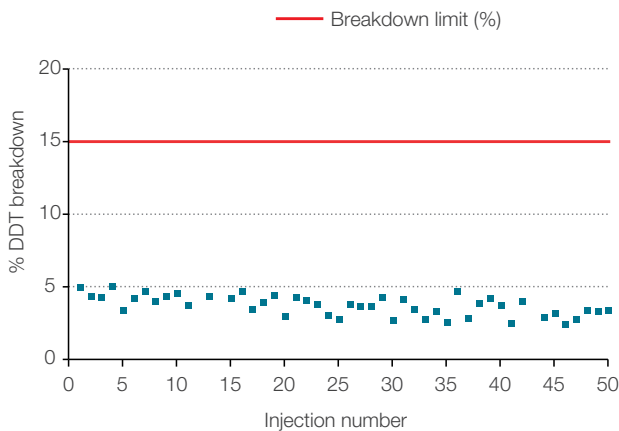








Figure 2: Compound degradation after 50 injections – LinerGOLD GC liners exhibit minimal breakdown



## LinerGOLD GC liners (continued)






### LinerGOLD GC Liners for Thermo Scientific TRACE 1300/1600 series and Agilent GC 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	<a href="#">453A2265-UI</a>	<a href="#">453A1262-UI</a>
	Split/splitless straight liner	4 x 6.3	78.5	No	<a href="#">453A1295-UI</a>	<a href="#">453A2292-UI</a>
	Splitless/split liner with single taper	4 x 6.5	78.5	No	<a href="#">453A1345-UI</a>	<a href="#">453A2342-UI</a>
	Splitless/split liner with single taper	4 x 6.5	78.5	Quartz wool	<a href="#">453A1925-UI</a>	<a href="#">453A2922-UI</a>
	Splitless liner with double taper	4 x 6.5	78.5	No	<a href="#">453A1355-UI</a>	<a href="#">453A2352-UI</a>
	Precision split/splitless liner	4 x 6.3	78.5	Quartz wool	<a href="#">453A1255-UI</a>	<a href="#">453A1252-UI</a>
	Direct straight liner	1 x 6.3	78.5	No	<a href="#">453A1335-UI</a>	<a href="#">453A2332-UI</a>
-	LinerGOLD mixed liner pack*	Mixed	78.5	Mixed	<a href="#">453TH002-UI</a>	-
	LinerGOLD double taper cyclo liner	4 x 6.5	78.5	No	<a href="#">453A1365-UI</a>	-
	LinerGOLD split cyclo liner	4 x 6.3	78.5	No	<a href="#">453A1375-UI</a>	-
	LinerGOLD straight liner	1.7 x 6.5	78.5	No	<a href="#">453A0415-UI</a>	-
	LinerGOLD straight liner	1.3 x 6.5	78.5	No	<a href="#">453A0411**</a>	-

\* LinerGOLD mixed liner pack (containing one liner of 453A1335-UI, 453A1345-UI, 453A1925-UI, 453A1295-UI, 453A2265-UI)

\*\* 3/pack











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

	Injection type	ID x OD (mm)	Length (mm)	Packing	Cat. no. (5/pack)
	Direct straight liner	5 x 8	105	No	<a href="#">45350030-UI</a>
	Splitless liner	3 x 8	105	No	<a href="#">45350032-UI</a>
	Splitless liner	5 x 8	105	No	<a href="#">45350033-UI</a>
	Precision liner	5 x 8	105	Quartz wool	<a href="#">453T1905-UI</a>
	Splitless precision liner	5 x 8	105	Quartz wool	<a href="#">453T2999-UI</a>

## Injection port liners for Thermo Scientific instruments














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

### Thermo Scientific™ Deactivated GC Liners for Thermo Scientific TRACE 1300/1600 series and Agilent GC 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	<a href="#">453A1335</a>	–
	Split straight liner	4 x 6.3	78.5	Quartz wool	<a href="#">453A2265</a>	<a href="#">453A1262</a>
	Split straight liner	4 x 6.3	78.5	No	<a href="#">453A1295</a>	<a href="#">453A2292</a>
	Split/splitless FocusLiner	4 x 6.3	78.5	Quartz wool	<a href="#">453A1255</a>	<a href="#">453A1252</a>
	Split/splitless FocusLiner with single taper	4 x 6.3	78.5	Quartz wool	<a href="#">453A1315</a>	<a href="#">453A1312</a>
	Split/splitless liner with single taper	4 x 6.3	78.5	No	<a href="#">453A1345</a>	<a href="#">453A2342</a>
	Split/splitless liner with double taper	4 x 6.3	78.5	No	<a href="#">453A1355</a>	–
	Split/splitless liner w/recessed gooseneck	4 x 6.3	78.5	Quartz wool	<a href="#">453A1305</a>	–
	Splitless liner with single taper	4 x 6.3	78.5	Quartz wool	<a href="#">453A1925</a>	<a href="#">453A2295</a>
	Split/splitless mini-lam liner	4 x 6.3	78.5	No	<a href="#">453A2009</a>	–
-	Split/splitless mixed liner sample pack	Mixed	Mixed	Mixed*	<a href="#">453TH002</a>	–





\* Mixed pack contains one liner of 453A1345, 453A1335, 453A1925, 453A1295, 453A2265

### Deactivated GC liners for Thermo Scientific TRACE 1300/1600 series and TRACE ULTRA 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	–	<a href="#">45352054</a>	–
	PTV straight liner	2 x 2.75	120	No	–	<a href="#">45352057</a>	<a href="#">45354057</a>
	PTV straight liner	2 x 2.75	120	No	<a href="#">45322045</a>	–	–
	PTV liner with sintered lining	1.75 x 2.75	120	No	–	<a href="#">45352060</a>	–
	PTV liner with three baffles	1 x 2.75	120	No	–	<a href="#">45352062</a>	–
	PTV SiITek metal liner	1 x 2.75	120	No	<a href="#">45322046</a>	–	–
	PTV SiITek metal liner	2 x 2.75	120	No	<a href="#">45322044</a>	–	–
	PTV SiITek metal liner	2 x 2.75	120	Quartz wool	<a href="#">45322056</a>	–	–
	PTV baffle liner (siltek)	2 x 2.75	120	No	–	<a href="#">453T2120</a>	–
	PTV split liner with recessed gooseneck	2 x 2.75	120	Quartz wool	–	<a href="#">45352070</a>	–
	PTV silcosteel liner for OC	1 x 2.75	120	No	<a href="#">45322052</a>	–	–
	PTV liner with concentric baffle	2 x 2.75	120	No	–	<a href="#">453T2845-UI</a>	–
	PTV liner with five baffles	1 x 2.75	120	No	–	<a href="#">453T2171-UI</a>	–

## Injection port liners for Thermo Scientific instruments (continued)

### Deactivated 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	<a href="#">45350030</a>	—
	Split straight liner	3 x 8	105	No	<a href="#">45350031</a>	—
	Split straight liner	5 x 8	105	CarboFrit	<a href="#">453T2131</a>	—
	Splitless straight liner	3 x 8	105	No	<a href="#">45350032</a>	—
	Splitless straight liner	5 x 8	105	No	<a href="#">45350033</a>	<a href="#">45354033</a>
	Splitless straight liner	5 x 8	105	CarboFrit	<a href="#">453T2130</a>	—
	Splitless straight liner (SilTek)	3 x 8	105	No	<a href="#">453T2121</a>	—
	Split FocusLiner for 50 mm needle	5 x 8	105	Quartz wool	<a href="#">453T1905</a>	<a href="#">453T4905</a>
	Splitless FocusLiner for 50 mm needle	5 x 8	105	Quartz wool	<a href="#">453T2999</a>	<a href="#">453T4999</a>
	Splitless FocusLiner for 70 mm needle	5 x 8	105	Quartz wool	<a href="#">453T2895</a>	<a href="#">453T4895</a>
	Split/splitless straight liner	0.75 x 2.75	105	No	<a href="#">45352083</a>	—
















### Thermo Scientific™ Liner Sealing Rings for Thermo Scientific instruments

Description	Quantity	Cat. no.
Liner sealing ring for TRACE 1300/1600 series GC SSL injector	5/pack	<a href="#">29001320</a>
Liner sealing ring for TRACE 1300/1600 series GC PTV injector	Each	<a href="#">29001318</a>
Liner sealing ring for TRACE and FOCUS GC SSL injector	10/pack	<a href="#">29033406</a>
Liner sealing ring for TRACE PTV injector	2/pack	<a href="#">29013417</a>
Liner sealing ring for Purge&Trap adaptor	Each	<a href="#">MI-290AA1-0001</a>



## Injection port liners for Agilent instruments

### Deactivated 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	<a href="#">453A1335</a>	—
	Split straight liner	4 x 6.3	78.5	Quartz wool	<a href="#">453A2265</a>	<a href="#">453A1262</a>
	Split straight liner	4 x 6.3	78.5	No	<a href="#">453A1295</a>	<a href="#">453A2292</a>
	Split/splitless FocusLiner	4 x 6.3	78.5	Quartz wool	<a href="#">453A1255</a>	<a href="#">453A1252</a>
	Split/splitless FocusLiner with single taper	4 x 6.3	78.5	Quartz wool	<a href="#">453A1315</a>	<a href="#">453A1312</a>
	Split/splitless liner with single taper	4 x 6.3	78.5	No	<a href="#">453A1345</a>	<a href="#">453A2342</a>
	Split/splitless liner with double taper	4 x 6.3	78.5	No	<a href="#">453A1355</a>	—
	Split/splitless liner w/recessed gooseneck	4 x 6.3	78.5	Quartz wool	<a href="#">453A1305</a>	—
	Split/splitless FAST FocusLiner	2.3 x 6.3	78.5	Quartz wool	<a href="#">453A1285</a>	<a href="#">453A2282</a>
	Split/splitless FAST FocusLiner with single taper	2.3 x 6.3	78.5	Quartz wool	<a href="#">453A2375</a>	—
	Splitless liner with single taper	4 x 6.3	78.5	Quartz wool	<a href="#">453A1925</a>	—
	Splitless straight liner	2.0 x 6.3	78.5	No	<a href="#">453A2275</a>	—
	Single gooseneck (deactivated metal)	5.2 x 6.3	78.5	No	<a href="#">453A2001</a>	—
	Cyclo splitter liner (deactivated metal)	5.2 x 6.3	78.5	No	<a href="#">453A2002</a>	—
	Split/splitless liner with wool (deactivated metal)	5.2 x 6.3	78.5	Quartz wool	<a href="#">453A2003</a>	—
—	Split/splitless mixed liner sample pack	Mixed	Mixed	Mixed*	<a href="#">453AG001</a>	—

\* Mixed pack contains one liner of 453A1255, 453A1295, 453A1315, 453A1345, 453A2275

### Liner sealing rings for Agilent instrument

Description	Quantity	Cat. no.
Graphite liner sealing ring for Agilent SSL liners	10/pack	<a href="#">290GA243</a>
Viton liner sealing ring for Agilent SSL injector	10/pack	<a href="#">290OA241</a>

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



# Ferrules

## Thermo Scientific™ 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.

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.

Learn more at

[thermofisher.com/smartchromatography/syringe](http://thermofisher.com/smartchromatography/syringe)

Ferrule type	Suitable for GC-MS	Temp limit (°C)	Re-usable
Graphite	No	450	Yes
Graphite/vespel	Yes	350	No
Stainless steel (SiTite)	Yes	500	No

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

Suitable for	100% graphic ferrules	Graphite/vespel ferrules	Siltite metal ferrules
Thermo Scientific™ TRACE™ Ultra SSL injector	•	•	
Thermo Scientific TRACE 1300/1600 series and Agilent SSL injectors	•	•	•
Thermo Scientific TRACE Ultra non-MS detectors	•	•	
Thermo Scientific TRACE 1300/1600 series and Agilent non-MS detectors	•	•	
All Thermo Scientific and Agilent MS detectors		•	•
Thermo Scientific PTV injector	•	•	

### 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.



### Graphite/vespel ferrules

The mechanically robust graphite/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.



### SiTite metal ferrules

The Thermo Scientific™ SiTite™ 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, SiTite ferrules do not need re-tightening after installation.



## Ferrules and nuts for Thermo Scientific instruments

For use with	Material type	Ferrule size for column ID (mm)	Quantity	Cat. no.
Thermo Scientific™ TRACE™ 1300/1600 series SSL injectors and detectors	100% graphite	0.1-0.32	10/pack	<a href="#">290GA139</a>
		0.45-0.53	10/pack	<a href="#">290GA140</a>
		0.1-0.25	10/pack	<a href="#">290VA191</a>
	15% graphite/85% vespel	0.32	10/pack	<a href="#">290VA192</a>
		0.53	10/pack	<a href="#">290VA193</a>
Thermo Scientific capillary column nut for TRACE 1300/1600 series SSL injectors and non-MS detectors	Stainless steel	–	5/pack	<a href="#">35050458</a>
Thermo Scientific TRACE 1300/1600 series PTV injectors	100% graphite	0.1-0.25	10/pack	<a href="#">29053488</a>
		0.32	10/pack	<a href="#">29053487</a>
		0.53	10/pack	<a href="#">29053486</a>
Thermo Scientific capillary column nut for TRACE 1300/1600 series PTV injectors	Stainless steel	–	5/pack	<a href="#">35053221</a>
Thermo Scientific™ TRACE™ Ultra injectors and non-MS detectors	100% graphite	0.1-0.25	10/pack	<a href="#">29053488</a>
		0.32	10/pack	<a href="#">29053487</a>
		0.53	10/pack	<a href="#">29053486</a>
Thermo Scientific™ capillary column nut for TRACE Ultra	Brass	–	5/pack	<a href="#">35032423</a>
Thermo Scientific™ MS detectors	15% graphite/85% vespel	0.1-0.25	10/pack	<a href="#">29033496</a>
		0.32	10/pack	<a href="#">29033497</a>
Thermo Scientific™ capillary column nut for MS detector	Brass	–	5/pack	<a href="#">290BT240</a>
	Stainless steel	–	5/pack	<a href="#">290BT241</a>
Thermo Scientific MS detectors	VESPEL SCP-5000	0.1-0.25	5/pack	<a href="#">290VT221</a>
Thermo Scientific™ capillary column spring loaded nut for MS detectors	Stainless steel for ISQ/TSQ/ Orbitrap Exploris	–	Each	<a href="#">1R120434-0010</a>
	Stainless steel for QE GC/Exactive GC	–	Each	<a href="#">1R120434-0020</a>
Thermo Scientific™ SilTite™ kit for Thermo Scientific TRACE 1300/1600 series GC SSL injectors	SilTite metal	0.1-0.25	Each*	<a href="#">290MA215</a>
		0.32	Each*	<a href="#">290MA216</a>
		0.53	Each*	<a href="#">290MA217</a>
Thermo Scientific™ SilTite™ kit for Thermo Scientific ISQ GC-MS interface	SilTite metal	0.1-0.25	Each*	<a href="#">290MA194</a>
		0.32	Each*	<a href="#">290MA195</a>
		0.53	Each*	<a href="#">290MA196</a>
Thermo Scientific™ replacement SilTite™ ferrules for TRACE 1300/1600 series and ISQ GC-MS interface kits	SilTite metal	0.1-0.25	10/pack	<a href="#">290MA201</a>
		0.32	10/pack	<a href="#">290MA202</a>
		0.53	10/pack	<a href="#">290MA203</a>
Thermo Scientific™ SilTite™ nuts for MS interface	–	–	5/pack	<a href="#">290MA205</a>
Thermo Scientific™ SilTite™ nuts for SSL injectors	–	–	5/pack	<a href="#">290MA207</a>
Thermo Scientific™ SilTite™ kits for Thermo Scientific™ DSQ GC-MS interface	SilTite metal	0.1-0.25	Each*	<a href="#">290MT229</a>
		0.32	Each*	<a href="#">290MT230</a>
		0.53	Each*	<a href="#">290MT231</a>
		Replacement SilTite nuts	5/pack	<a href="#">290MT211</a>
Thermo Scientific™ SilTite™ replacement ferrules for DSQ GC-MS interface kits	SilTite metal	0.1-0.25	10/pack	<a href="#">290MT221</a>
		0.32	10/pack	<a href="#">290MT222</a>
		0.53	10/pack	<a href="#">290MT223</a>
Thermo Scientific TRACE 1600 series iConnect SSL injectors with HeSaver-H <sub>2</sub> Safer	SilTite metal	< or = 0.25	10/pack	<a href="#">29063465</a>
	SilTite metal	0.25	10/pack	<a href="#">29063466</a>
	SilTite metal	0.32	10/pack	<a href="#">29063467</a>
Thermo Scientific column nut for TRACE 1600 series iConnect SSL injectors with HeSaver-H <sub>2</sub> Safer	–	–	2/pack	<a href="#">290SF303</a>

\* SilTite kits contain 2 SilTite nuts and 10 ferrules

## Ferrules for Agilent instruments

For use with	Material type	Ferrule size column ID (mm)	Quantity	Cat. no.
Agilent injectors and non-MS detectors	100% graphite	0.1-0.32	10/pack	<a href="#">290GA139</a>
		0.45-0.53	10/pack	<a href="#">290GA140</a>
		Packed column 1/8" OD	10/pack	<a href="#">290GA108</a>
		Packed column 1/4" OD	10/pack	<a href="#">290GA107</a>
	15% graphite/85% vespel	0.1-0.25	10/pack	<a href="#">290VA191</a>
		0.32	10/pack	<a href="#">290VA192</a>
		0.53	10/pack	<a href="#">290VA193</a>
		Packed column 1/8" OD	10/pack	<a href="#">290VT168</a>
		Packed column 1/4" OD	10/pack	<a href="#">290VT165</a>
		Capillary column nut for injectors and non-MS detectors	Stainless steel	—
Agilent MS detectors	15% graphite/85% vespel	0.1-0.25	10/pack	<a href="#">29033496</a>
		0.32	10/pack	<a href="#">29033497</a>
		0.53	10/pack	<a href="#">290VP144</a>
Thermo Scientific™ SilTite™ kits for Agilent SSL injectors	SilTite metal	0.1-0.25	Each*	<a href="#">290MA215</a>
		0.32	Each*	<a href="#">290MA216</a>
		0.53	Each*	<a href="#">290MA217</a>
SilTite nuts for MS interface	—	—	5/pack	<a href="#">290MA205</a>
Thermo Scientific™ SilTite™ Kit for Agilent MS detectors	SilTite metal	0.1-0.25	Each**	<a href="#">290MA194</a>
		0.32	Each**	<a href="#">290MA195</a>
		0.53	Each**	<a href="#">290MA196</a>
Thermo Scientific™ SilTite™ Replacement Ferrules for all SilTite kits	SilTite metal	0.1-0.25	10/pack	<a href="#">290MA201</a>
		0.32	10/pack	<a href="#">290MA202</a>
		0.53	10/pack	<a href="#">290MA203</a>
Thermo Scientific™ Nuts for SSL injectors	—	—	5/pack	<a href="#">290MA207</a>

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

## Thermo Scientific™ SilTite™ $\mu$ -Union column connectors

### The tiny connection for GC columns

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

Learn more at

[thermofisher.com/gcparts](https://thermofisher.com/gcparts)



- Zero dead volume – giving optimized peak shapes
- Thermo Scientific™ Finger Tite technology – easy to install and leak-free
- Highly inert and robust

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

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

### SilTite $\mu$ -Union kits, ferrules, and replacement unions

Column ID (mm)	2 <sup>nd</sup> column ID (mm)	Cat. no. SilTite $\mu$ -Union kit (Each)	Cat. no. SilTite $\mu$ -Union ferrules (10/pack)	Cat. no. SilTite $\mu$ -Union replacement union (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

## Thermo Scientific™ 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

### Thermo Scientific SilTite capillary column connectors and ferrules

Column ID (mm)	2nd column ID (mm)	Cat. no. SilTite column connector kit (Each)	Cat. no. SilTite ferrules (10/pack)	Cat. no. replacement SilTite connector nuts* (Each)
0.1-0.25	0.1-0.53	<a href="#">290MU498</a>	<a href="#">290MF229</a>	<a href="#">290MN211</a>
0.32	0.32-0.53	<a href="#">290MU499</a>	<a href="#">290MF230</a>	<a href="#">290MN211</a>
0.53	0.45-0.53	<a href="#">290MU500</a>	<a href="#">290MF231</a>	<a href="#">290MN211</a>

\* SilTite nuts must be used with SilTite ferrules

## Thermo Scientific™ Mini Union Column Connectors

- For fused silica capillary columns
- Graphite/vespel ferrules
- Build retention gap



### Thermo Scientific mini union column connectors

Column ID (mm)	Cat. no. mini union column connector* (Each)	Cat. no. graphite/vespel ferrules (10/pack)	Cat. no. 2 meters deactivated silica tubing** (Each)
0.1-0.25	–	<a href="#">290VT186</a>	–
0.32	<a href="#">290GU498</a>	<a href="#">290VT187</a>	<a href="#">260G498P</a>
0.53	<a href="#">290GU499</a>	<a href="#">290VT188</a>	<a href="#">260G499P</a>

\* Includes one union, 2 nuts, and 5 ferrules

\*\*For more tubing, please refer to Thermo Scientific™ GuardGOLD™ Capillary Columns

## Thermo Scientific™ GC Capillary Connectors

### Thermo Scientific GC capillary connectors

Description	Quantity	Cat. no.
Universal capillary connector	10/pack	64000-001
Y capillary connector	Each	64000-002

## Thermo Scientific™ 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



### Thermo Scientific capillary column end caps

Description	Quantity	Cat. no.
Capillary column end caps, paired	10/pack	<a href="#">260EC111</a>

# Thermo Scientific™ Finger Tite Connectors

Easier fitting, reliable, and leak-free connections

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



## Thermo Scientific finger tite connectors for TRACE 1300/1600 series GC and Agilent GC systems

Description	Quantity	Cat. no.
Split/splitless and MS starter kit	Each	<a href="#">290SA131</a>
Split/splitless and FID starter kit	Each	<a href="#">290SA132</a>
Split/splitless injector base seal	Each	<a href="#">290SA133</a>
Ferrules for 0.1-0.25 mm ID columns	Each	<a href="#">290S1132</a>
Ferrules for 0.32 mm ID columns	Each	<a href="#">290S1131</a>

## Thermo Scientific finger tite connectors for TRACE GC Ultra and FOCUS GCs

Description	Quantity	Cat. no.
Female nut	5/pack	<a href="#">290ST130</a>
Ferrules for 0.1-0.25 mm ID columns	10/pack	<a href="#">290S1132</a>
Ferrules for 0.32 mm ID columns	10/pack	<a href="#">290S1131</a>

## Thermo Scientific™ SilFlow™ Devices

Switch your GC column to deliver flexible chromatography solution

- Use the 3-port Silflow connector for a dual-column configuration in case of 1 inlet-2 detectors or 2 inlets-1 detector
- Use the 3-port Silflow connector with an auxiliary gas channel to replace a column into the MS without venting in case no VPI is available
- Use the 3-port Silflow connector for setting up a backflush configuration
- Use the 5-port Silflow connector for setting up a 2D-GC (heart-cut) configuration
- Thermo Scientific™ SilTite™ Finger Tite Fittings for easy set up and a reliable seal



### Thermo Scientific SilFlow devices

Description	For use with	Quantity	Cat. no.
3 Port SilFlow Backflush MCD (0.25/0.32)	<b>For backflush analyses</b> Port A: 0.25 mm ID or 0.32 mm ID Port B: 0.25 mm ID or 0.32 mm ID	Each	<a href="#">60201-396</a>
3 Port SilFlow Backflush MCD (0.25/0.32/0.53)	<b>For backflush analyses</b> Port A: 0.25 mm D or 0.32 mm ID Port B: 0.53 mm ID	Each	<a href="#">60201-397</a>
3 Port SilFlow MCD (0.25/0.32)	<b>For splitter analyses</b> <i>(i.e. one injection to two analytical columns; one column to two detectors; allows column switching in GC-MS without the need to vent)</i> Port A: 0.25 mm ID or 0.32 mm ID Port B: 0.25 mm D or 0.32 mm ID	Each	<a href="#">60201-398</a>
5 Port SilFlow Deans Switch MCD (0.25/0.32)	<b>For multidimensional analyses</b> Port A: 0.25 mm ID or 0.32 mm ID Port B: 0.25 mm ID or 0.32 mm ID	Each	<a href="#">60201-389</a>



**Thermo Scientific™ SilFlow™ Replacement Parts**

Description	For use with	Quantity	Cat. no.
SilFlow fingertight ferrules for use with column of OD 0.32 mm columns	< = 0.25 mm ID columns	10/pack	29063465
SilFlow fingertight ferrules for use with column of OD 0.36 mm columns	0.25 mm ID columns	10/pack	<a href="#">29063466</a>
SilFlow fingertight ferrules for use with column of OD 0.45 mm	0.32 mm ID columns	10/pack	<a href="#">29063467</a>
SilFlow fingertight ferrules for use with column of OD 0.68 mm	0.53 mm ID columns	10/pack	29063464
SilFlow fingertight ferrules for OD 1.07 mm	Tubing of OD 1.07 mm	10/pack	29063463
Blanking ferrule	–	5/pack	290ST414
SilFlow nuts	SilFlow fingertight ferrules	10/pack	290SF302
SilFlow fingertight tool	–	Each	60201-401
Pre Swage tool 0.4	0.25 mm ID columns	Each	60201-415
Pre Swage tool 0.5	0.32 mm ID columns	Each	60201-416
Pre Swage tool 0.7	0.53 mm ID columns	Each	60201-417
Deactivated pre-column (0.53 mm/0.32 mm ID) kit for backflush with 60201-396		Each	60201-387
Deactivated tubing (170 µm, 0.36 mm OD, 60 cm)		Each	60201-390
Fused silica tubing (75 µm, 0.36 mm OD, 30 cm)		Each	60201-391
Deactivated tubing (0.1 mm ID, 0.36 mm OD, 2 m)		Each	60201-392
Deactivated tubing (0.1 mm ID, 0.36 mm OD, 1 m)		Each	60201-393
Deactivated tubing (170 µm, 0.36 mm OD, 120 cm)		Each	60201-394
Deactivated tubing (75 µm, 0.36 mm OD, 80 cm)		Each	60201-395
Deactivated tubing (150 µm, 0.36 mm OD, 240 cm)		Each	60201-399
Deactivated silica tubing (2 m, 0.53 mm ID)		Each	260G499P
GuardGOLD capillary column (2 m, 0.18 mm ID)		Each	26050-0218
GuardGOLD capillary column (10 m, 0.18 mm ID)		Each	26050-1018

# GC tools

## Support GC applications



### Thermo Scientific™ GC Tools

Description	Quantity	Cat. no.
Shortix capillary column cutter	Each	<a href="#">60180-835</a>
Shortix capillary column cutter repair kit	Each	<a href="#">60180-836</a>
Ceramic column cutter	Each	<a href="#">60201-318</a>

## Thermo Scientific™ GC Tool Kits

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

### Thermo Scientific GC tool kits

Description	Quantity	Cat. no.
Capillary tool kit for Thermo Scientific GCs	Each	<a href="#">60180-784</a>
Capillary tool kit for Agilent GCs	Each	<a href="#">60180-786</a>

## Thermo Scientific™ GC Installation Kit

Includes:

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



### Thermo Scientific GC installation kit

Description	Quantity	Cat. no.
GC installation kit	Each	<a href="#">60180-888</a>

## Thermo Scientific™ GC Tubing

GC tubing for plumbing GC systems

### Thermo Scientific GC tubing

Material	OD (in)	ID (in)	Length (ft)	Quantity	Cat. no.
Copper tubing*	1/8	0.065	50	Each	<a href="#">60181-632</a>
Stainless steel*	1/8	0.085	25	Each	<a href="#">60181-638</a>

\* Instrument-grade, cleaned

# Thermo Scientific™ GLD Pro Gas Leak Detector

## Aids in quickly locating and identifying gas leaks

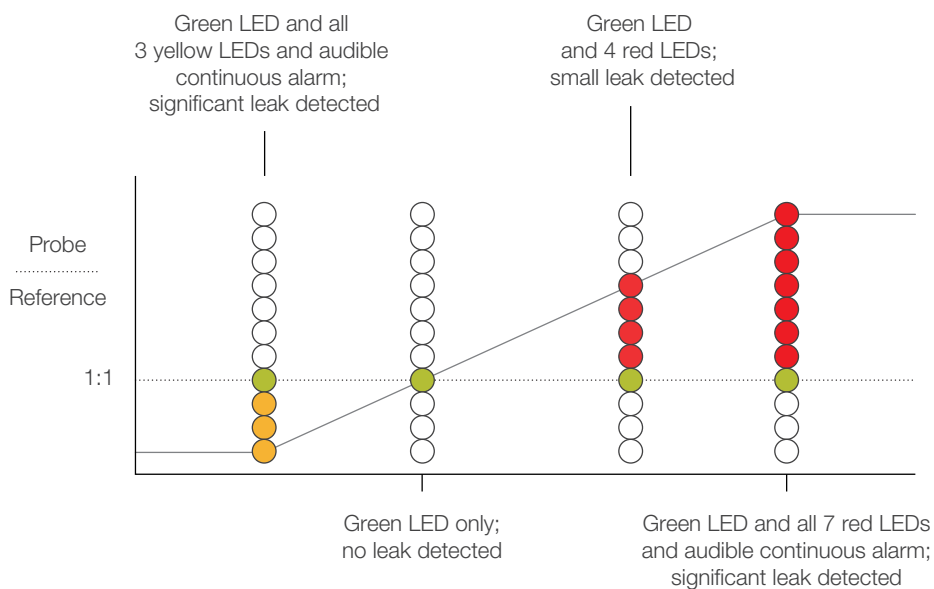
The Thermo Scientific GLD Pro gas leak detector is specifically designed for use with gas chromatography instruments. Detection of leaks allows the user to reduce detector noise, provide a stable baseline, reduce carrier gas by minimizing waste, and maximize the lifetime of the analytical column by minimizing 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 12 hrs. operation)
- Durable storage case
- Probe holder
- One year warranty



### GLD Pro gas leak detector

Description	Quantity	Cat. no.
GLD Pro gas leak detector	Each	<a href="#">66002-004</a>
Small probe adaptor	Each	<a href="#">66002-003</a>
Soft-Sided carry case (leak detector not included)	Each	<a href="#">66002-002</a>



# Thermo Scientific™ GFM Pro Flowmeter

## Measure and monitor flow quickly and efficiently

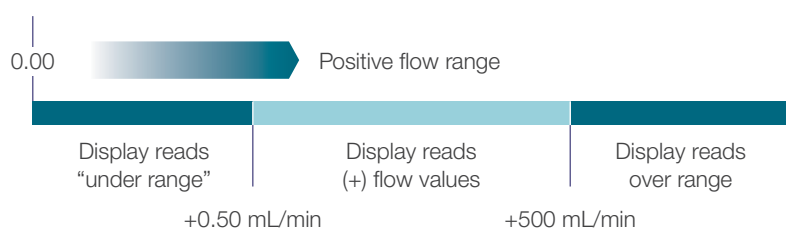
The Thermo Scientific GFM Pro flowmeter is specifically designed for use with gas chromatography instruments. This versatile product is an electronic device capable of measuring volumetric flow for all types of gases. Real-time measurements can be made for various types of flow paths including continually 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 0.5-500 mL/min
- Accuracy of +/- 2% of flow or +/- 0.2 mL/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	Quantity	Cat. no.
GFM Pro flowmeter	Each	<a href="#">66002-010</a>
Soft-Sided carry case (flowmeter not included)	Each	<a href="#">66002-002</a>
GFM Pro flowmeter re-calibration	Each	<a href="#">66002-GFMCAL</a>



# 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.

Learn more at

[thermofisher.com/gccolumns](https://thermofisher.com/gccolumns)

### Application-specific GC capillary columns

Industry	Phases
Environmental and food	<ul style="list-style-type: none"><li>• TG-VVOC B; TG-VMS, TG-VRX, TR-V1; TG-624; TG-624SiIMS; TG-SVOC, TR-524, TR-525, TR-8095; TR-8270; TG Mineral oil</li><li>• TG-PEST; TR-Pesticide; TR-Pesticide II; TR-Pesticide III; TR-Pesticide IV; TG-OCP, TG-OPP, TG-5LPGC-MS</li><li>• TR-FFAP; TR-FAMEs; TG-GlyceridesLB;</li><li>• TG-PAH, TG-PBDE, TR-PCB 8MS, TG-Dioxin; TR-Dioxin; TG-XLBMS; TG-Contaminants</li></ul>
Clinical/forensic/toxicology	<ul style="list-style-type: none"><li>• TG-ALC Plus; TG-ALC</li><li>• TR-DoA35; TR-DoA5</li></ul>
Petrochemical	<ul style="list-style-type: none"><li>• TR-BioDiesel; TG-BioDiesel metal; TG-TCEP; TR-SIMDIST; TG-DHA50</li></ul>
System qualification test	<ul style="list-style-type: none"><li>• TG-SQC</li><li>• TR-5</li></ul>

## Wall-coated open tubular (WCOT) columns

Description	Phases			
Low polarity	<b>100% dimethyl polysiloxane</b>			
	TG-1MS	TG-1MT metal	TR-1	TR-1MS
	<b>5% phenyl, 95% dimethyl polysiloxane</b>			
	TG-5MS	TG-5MT metal	TG-5SiMS	TG-5HT
	TG-5MS AMINE	TR-5	TR-5HT	TR-5MS
	<b>35-50% phenyl dimethyl polysiloxane</b>			
Mid polarity	TG-35MS	TG-35MS AMINE	TR-35MS	TG-17MS
	TG-17SiMS	TR-50MS	-	-
	<b>Cyanopropylphenyl dimethyl polysiloxane</b>			
	TG-1301MS	TG-624	TG-624SiMS	TG-1701MS
	TR-1701	-	-	-
	<b>Trifluoropropylmethyl</b>			
TG-200MS	-	-	-	
High polarity	<b>50% cyanopropylphenyl, 50% dimethyl polysiloxane</b>			
	TG-225MS	-	-	-
	<b>Polyethylene (PEG)</b>			
	TG-WaxMS	TG-WaxMT metal	TG-WaxMS A	TG-WaxMS B
	TR-Wax	TR-WaxMS	-	-
	<b>Biscyanopropyl, cyanopropylphenyl</b>			
TG-Polar	-	-	-	

## Porous layer open tubular (PLOT) columns

Description	Phases			
TracePLOT	TG-BOND Alumina	TG-BOND Sieve 5A	TG-BOND Q	TG-BOND Q+
	TG-BOND S	TG-BOND U	Particle trap	-

## Packed and micropacked columns

Description	Phases			
Molecular sieve	MOLSIEVE 5A	MS-13X	-	-
Porous polymer	HAYESEP D	HAYESEP DB	HAYESEP N	HAYESEP P
	HAYESEP Q	HAYESEP QS	HAYESEP R	HAYESEP S
	HAYESEP T	-	-	-
ShinCarbon	Shincarbon ST	-	-	-
Silica	10%SE-30 DIATO-WAW	1.5%OV-101 CHR-GHP	30%DC-200/500 CHR-PAW	1.0% OV-101 CHR-GAW
Application-specific	20%TCEP CHR-PAW	Two column set for ASTM D3606	-	-

## Guard columns

Description	Phases			
Guard columns	GuardGOLD	HydroGOLD	-	-

## Application kits

Description
Volatile organic compounds (VOC) application kit
Semi-volatile organic compounds (SVOC) application kit
Persistent organic pollutants (POPs) confirmation kit
Dioxin Analyzer Triplus RSH-PTV essentials kit



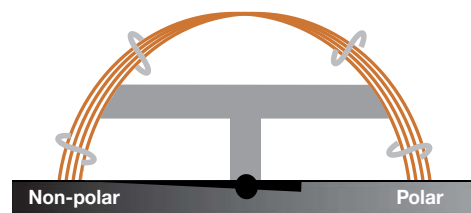
# Application-specific columns

## for very volatile organic compounds (VVOC)

### Thermo Scientific™ TraceGOLD™ TG-VVOC B GC Columns

Application-specific column for very volatile organic compounds

- Unique selectivity for analysis of very volatile compounds
- Base deactivation creates inert surface for sensitive compounds, such as amines
- Highly robust phase



Phase:	Proprietary
Max. temp.:	270°C/290°C
USP listing:	NA

#### Thermo Scientific TraceGOLD TG-VVOC B GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.32	30	5.0	Each	<b>26058-3050</b>
	60	5.0	Each	<a href="#">26058-5180</a>

#### Applications:

- Volatile amines
- Air toxics
- Oxygenated volatiles

#### Similar to:

- CP-Volamine

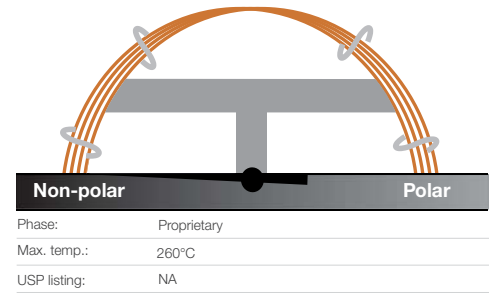
# Application-specific columns

## for volatile organic pollutants (VOP) and impurities

### Thermo Scientific™ TraceGOLD™ TG-VMS GC Columns

Application-specific column for volatile organic pollutants by GC-MS

- 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



#### Thermo Scientific TraceGOLD TG-VMS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.18	20	1.0	Each	<a href="#">26080-4950</a>
0.25	30	1.4	Each	<a href="#">26080-3320</a>
	60	1.4	Each	<a href="#">26080-3330</a>
0.32	60	1.8	Each	<a href="#">26080-3410</a>

#### Applications:

- Volatile organic pollutants
- U.S. EPA methods 8260B, 524, 624

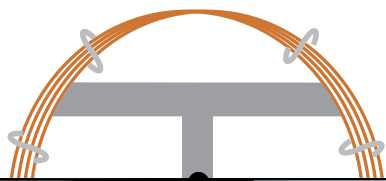
#### Similar to:

- Rtx-VMS

## Thermo Scientific™ 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



Non-polar		Polar	
Phase:	Proprietary		
Max. temp.:	260°C		
USP listing:	NA		

### Thermo Scientific TraceGOLD TG-VRX GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.18	20	1.0	Each	<a href="#">26081-4950</a>
	40	1.0	Each	<a href="#">26081-4960</a>
0.25	30	1.4	Each	<a href="#">26081-3320</a>
	60	1.4	Each	<a href="#">26081-3330</a>
0.32	30	1.8	Each	<a href="#">26081-3390</a>
	60	1.8	Each	<a href="#">26081-3410</a>

#### Applications:

- Volatile organic pollutants
- U.S. EPA methods 8021, 8010, 8020

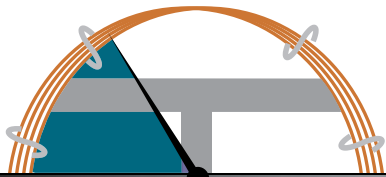
#### Similar to:

- Rtx-VRX
- DB-VRX

## Thermo Scientific™ TRACE™ TR-V1 GC Columns

Application-specific column for volatile organic pollutants

- Mid-polarity phase, 6% cyanopropylphenyl polysiloxane
- Thick films for the analysis of volatile analytes
- High thermal stability – maximum temperatures up to 300 °C



Non-polar		Polar	
Phase:	6% cyanopropylphenyl polysiloxane		
Max. temp.:	280°C/300°C		
USP listing:	G43		

### Thermo Scientific TRACE TR-V1 GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.18	20	1.0	Each	<a href="#">260V495P</a>
	30	1.4	Each	<a href="#">260V332P</a>
0.25	60	1.4	Each	<a href="#">260V333P</a>
	30	1.8	Each	<a href="#">260V339P</a>
0.32	60	1.8	Each	<a href="#">260V341P</a>
	30	3.0	Each	<a href="#">260V396P</a>

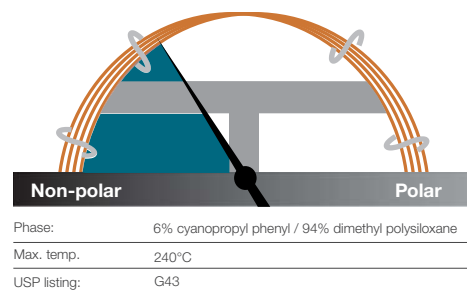
#### Applications:

- Volatile organics
- Alcohols
- U.S. EPA methods 502.2, 608, and 624

# Thermo Scientific™ TraceGOLD™ TG-624 GC Columns

Application-specific column for volatile organic pollutants and impurities

- Mid-polarity phase
- Ideal for EPA methods 624, 608 and US Pharmacopeia (USP) <467> method
- Allows resolution of 2-nitropropane from 1,1-dichloropropanone under EPA method 524.2 revision IV



## Thermo Scientific TraceGOLD TG-624 GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.18	20	1.0	Each	<a href="#">26085-4950</a>
	40	1.0	Each	<a href="#">26085-4960</a>
0.25	30	1.4	Each	<a href="#">26085-3320</a>
	60	1.4	Each	<a href="#">26085-3330</a>
0.32	30	1.8	Each	<a href="#">26085-3390</a>
	60	1.8	Each	<a href="#">26085-3410</a>
0.53	30	3.0	Each	<a href="#">26085-3960</a>
	60	3.0	Each	<a href="#">26085-4080</a>
	75	3.0	Each	<a href="#">26085-4900</a>
	105	3.0	Each	<a href="#">26085-4090</a>

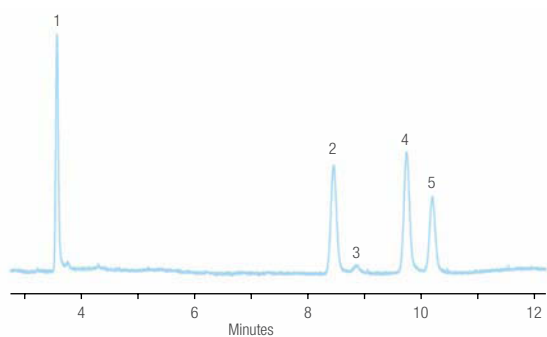
## Applications:

- 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



### TraceGOLD TG-624 columns

30 m x 0.32 mm x 1.80 µm

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

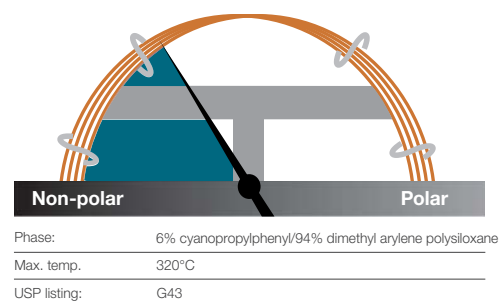
Detector type: FID  
Carrier gas: He  
Flow rate: 2.15 mL/min  
Injection volume: 1 µL  
Injection mode: Headspace, split (1:5), 140 °C

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

# Thermo Scientific™ TraceGOLD™ TG-624SiIMS GC Columns

Application-specific column for volatile organic pollutants and impurities

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



## Thermo Scientific TraceGOLD TG-624SiIMS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.18	20	1.0	Each	<a href="#">26059-4950</a>
0.25	30	1.4	Each	<a href="#">26059-3320</a>
	60	1.4	Each	<a href="#">26059-3330</a>
0.32	30	1.8	Each	<a href="#">26059-3390</a>
	60	1.8	Each	<a href="#">26059-3410</a>
0.53	30	3.0	Each	<a href="#">26059-3960</a>
	60	3.0	Each	<a href="#">26059-4080</a>

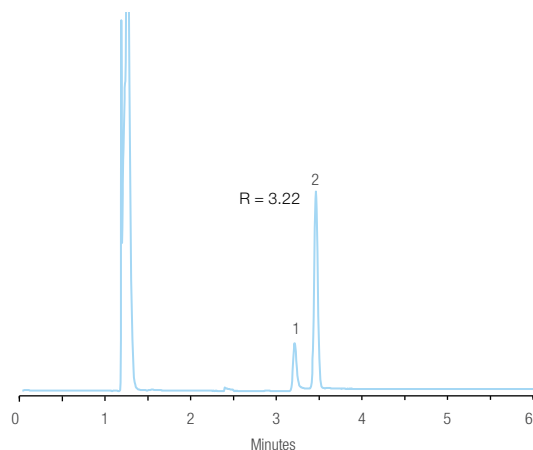
### Applications:

- Residual solvents
- Volatile organic compounds
- Alcohols
- Oxygenates

### Similar to:

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

## Acetonitrile and dichloromethane



### TraceGOLD TG-624SiIMS columns 30 m × 0.32 mm × 1.8 µm

Temperature:	40 °C for 6 minutes
Detector type:	MS (ISQ); <i>m/z</i> 40,41 for Acetonitrile (1), <i>m/z</i> 49, 84 for Dichloromethane (2)
Carrier gas:	Helium
Flow rate:	1.5 mL/min
Injection volume:	500 µL
Injection mode:	Headspace, split (20:1) 220 °C

1. Acetonitrile
2. Dichloromethane

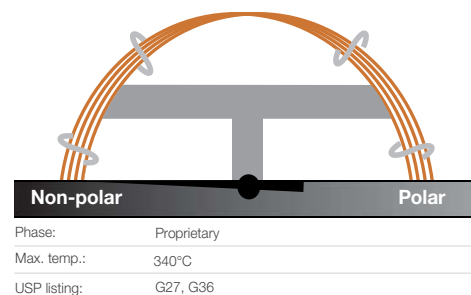
# Application-specific columns

## for semi-volatile organic compounds (SVOC)

### Thermo Scientific™ TraceGOLD™ TG-SVOC GC Columns

Application-specific column for semi-volatile organic compounds

- Outstanding balanced inertness for analysis of semivolatiles in complex matrices
- Excellent reproducibility and peak shapes even for problematic compounds like phenol, nitrophenol, pentachlorophenol
- Long column lifetime
- Ideal for EPA method 8270



#### Thermo Scientific TraceGOLD TG-SVOC GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.18	20	0.18	Each	26057-5780
0.25	30	0.25	Each	26057-1420

#### Applications:

- Basic, acidic and neutral compounds
- Polycyclic aromatic hydrocarbons (PAHs)
- Chlorinated hydrocarbons
- Pesticides
- Phthalate ester phenols

#### Similar to:

- DB-UI 8270D
- ZB-Semivolatiles

# Application-specific columns

## for EPA methods

### Thermo Scientific™ application-specific GC Columns for EPA methods

#### Application-specific GC columns for EPA methods

- TRACE TR-524 and TRACE TR-525 columns: US EPA Drinking Water Test methods 524 or 525
- TRACE TR-8270 columns: US EPA Solid Waste Test method 8270
- TRACE TR-8095 columns: US EPA Explosives Test method 8095 featuring high max temperature and low surface activity

#### Thermo Scientific TR-524, TR-525, TR-8095, TR-8270 columns

Phase	ID (mm)	Length (m)	Film thickness (μm)	Quantity	Cat. no.
TR-524	0.18	20	1.0	Each	<a href="#">26RV495P</a>
TR-525	0.25	30	0.25	Each	<a href="#">26RX142P</a>
TR-8095	0.32	12	0.25	Each	<a href="#">260P123P</a>
TR-8270	0.25	30	0.5	Each	<a href="#">26RF223P</a>

#### Applications:

- Volatile organic compounds (VOCs)
- Pesticides
- Flame retardants
- Explosives

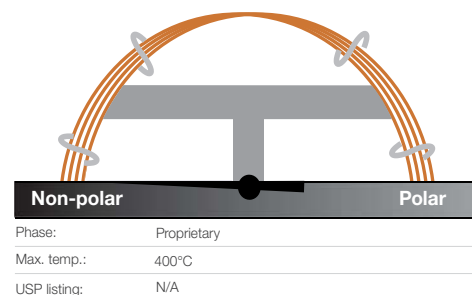
# Application-specific columns

## for mineral oil

### Thermo Scientific™ TraceGOLD™ TG-Mineral oil GC Columns

Application-specific GC column for mineral oil

- Fast mineral oil screening
- Proprietary phase guarantees long lifetime and stability to 400 °C



#### Thermo Scientific TraceGOLD TG-Mineral Oil GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.32	15	0.10	Each	26069-0480
0.32	15	0.15	Each	26069-5230
0.32	15	0.30	Each	26069-5240

#### Applications:

- Total petroleum hydrocarbons (TPH)
- Hydrocarbon oil index, DIN EN ISO 9377-2:2000



# Application-specific columns

## for pesticides

Thermo Scientific™ TraceGOLD™ TG-PEST GC Columns

Thermo Scientific™ TRACE™ TR-Pesticide GC Columns (low-polarity)

Thermo Scientific™ TRACE™ TR-Pesticide II GC Columns (low-polarity, low bleed)

Thermo Scientific™ TRACE™ TR-Pesticide III GC Columns (mid-polarity)

Thermo Scientific™ TRACE™ TR-Pesticide IV GC Columns (mid-polarity)

Application-specific GC column for multi-residue 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

### Thermo Scientific application-specific GC columns for pesticides

Phase	ID (mm)	Length (m)	Film thickness (µm)	Guard	Quantity	Cat. no.
TG-PEST	0.18	20	0.20	-	Each	26052-1580
TR-Pesticide	0.25	30	0.25	5 m guard column attached	Each	<a href="#">26RF142F</a>
TR-Pesticide II	0.25	30	0.25	5 m guard column attached	Each	<a href="#">26RD142F</a>
TR-Pesticide III	0.25	30	0.25	5 m guard column attached	Each	<a href="#">26RC142F</a>
TR-Pesticide IV	0.25	30	0.25	-	Each	<a href="#">26RC142P</a>

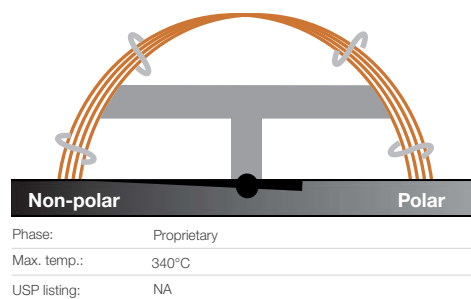
#### Applications:

- Organophosphate pesticides
- Organochlorine pesticides
- Pyrethroid pesticides
- Herbicides

## Thermo Scientific™ TraceGOLD™ TG-OCP I and 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



### Thermo Scientific TraceGOLD TG-OCP I GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	<a href="#">26078-1420</a>
0.32	30	0.32	Each	<a href="#">26078-5760</a>

### Thermo Scientific TraceGOLD TG-OCP II GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.2	Each	<a href="#">26077-5720</a>
0.32	30	0.25	Each	<a href="#">26077-1430</a>

#### Applications:

- Organochlorine pesticides
- Herbicides

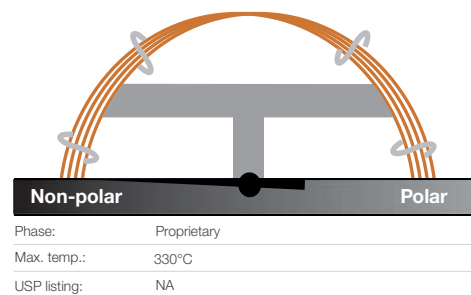
#### Similar to:

- Rtx-CLPesticides
- Rtx-CLPesticides2

## Thermo Scientific™ TraceGOLD™ TG-OPP I and 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



### Thermo Scientific TraceGOLD TG-OPP I GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	<a href="#">26076-1420</a>
0.32	30	0.5	Each	<a href="#">26076-2240</a>

### Thermo Scientific TraceGOLD TG-OPP II GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	<a href="#">26075-1420</a>
0.32	30	0.32	Each	<a href="#">26075-5760</a>

#### Applications:

- Organophosphorus pesticides

#### Similar to:

- Rtx-OPPesticides
- Rtx-OPPesticides2

# Application-specific columns

## for GC-MS

### Thermo Scientific™ TraceGOLD™ TG-LPGC-MS Columns

Application-specific column for GC-MS

- Fast run times under MS vacuum
- Less system maintenance
- High sample capacity

#### Thermo Scientific™ TraceGOLD™ TG-5LPGC-MS Columns

ID (mm)	Length (m)	Film thickness (µm)	Guard	Max. temp	Quantity	Cat. no.
0.53	16	1.0	5 m, 0.18 mm ID	340 °C/340 °C	Each	<a href="#">21098-2865</a>
0.32	10	1.0	5 m, 0.15 mm ID	340 °C/340 °C	Each	<a href="#">21098-4425</a>

#### Thermo Scientific™ TraceGOLD™ TG-624SiLPGC-MS Column

ID (mm)	Length (m)	Film thickness (µm)	Guard	Max. temp	Quantity	Cat. no.
0.32	10	1.8	5 m, 0.15 mm ID	300 °C/320 °C	Each	<a href="#">21059-4435</a>

#### Thermo Scientific™ TraceGOLD™ TG-35SiLPGC-MS Columns

ID (mm)	Length (m)	Film thickness (µm)	Guard	Max. temp	Quantity	Cat. no.
0.32	10	0.25	5 m, 0.15 mm ID	340 °C/360 °C	Each	<a href="#">21093-4415</a>

#### Thermo Scientific™ TraceGOLD™ TG-200LPGC-MS Columns

ID (mm)	Length (m)	Film thickness (µm)	Guard	Max. temp	Quantity	Cat. no.
0.32	10	1.0	5 m, 0.15 mm ID	290 °C /310 °C	Each	<a href="#">21084-4425</a>

#### Thermo Scientific™ TraceGOLD™ TG-17SiLPGC-MS Columns

ID (mm)	Length (m)	Film thickness (µm)	Guard	Max. temp	Quantity	Cat. no.
0.32	10	0.25	5 m, 0.15 mm ID	340 °C /360 °C	Each	<a href="#">21072-4415</a>

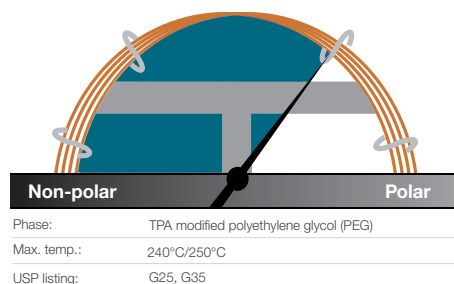
# Application-specific columns

## for free fatty acid (FFAP)

### Thermo Scientific™ TRACE™ TR-FFAP GC Columns

Application-specific columns for FFAP analysis

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



#### Thermo Scientific TRACE TR-FFAP GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.25	Each	<a href="#">260N130P</a>
	30	0.25	Each	<a href="#">260N142P</a>
	60	0.25	Each	<a href="#">260N154P</a>
0.32	30	0.25	Each	<a href="#">260N143P</a>
	50	0.5	Each	<a href="#">260N230P</a>
0.53	30	0.5	Each	<a href="#">260N225P</a>
		1.0	Each	<a href="#">260N298P</a>

#### Applications:

- FFAP analysis
- Acidic compound analysis

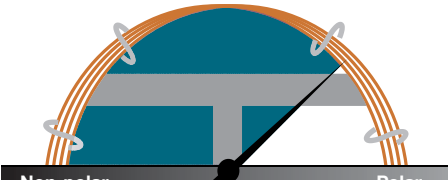
# Application-specific columns

## for fatty acid methyl esters (FAMES)

### Thermo Scientific™ TRACE™ TR-FAME GC Columns

Application-specific columns for Fatty Acid Methyl Esters (FAMES) analysis

- Polar phase, 70% cyanopropyl polysilphenylene-siloxane
- High operating temperature compared to competitor columns
- Optimized for detailed cis/trans FAME analysis
- Application-specific QC testing ensures reliable performance for AOAC methods



Phase:	70% cyanopropyl polysilphenylene-siloxane
Max. temp.:	250°C/260°C
USP listing:	NA

#### Thermo Scientific TRACE TR-FAME GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.10	10	0.2	Each	<a href="#">260M096P</a>
	30	0.25	Each	<a href="#">260M141P</a>
0.22	50	0.25	Each	<a href="#">260M147P</a>
	30	0.25	Each	<a href="#">260M142P</a>
	60	0.25	Each	<a href="#">260M154P</a>
0.25	100	0.20	Each	<a href="#">260M238P</a>
	120	0.25	Each	<a href="#">260M166L</a>
	30	0.25	Each	<a href="#">260M143P</a>
0.32	50	0.25	Each	<a href="#">260M149P</a>
	60	0.25	Each	<a href="#">260M155P</a>

#### Applications:

- FAMES
- FAMES cis/trans isomers


# Application-specific columns

## for triglycerides

### Thermo Scientific™ TraceGOLD™ TG-GlyceridesLB GC Columns

Application-specific column for triglycerides

- Low column bleed
- Excellent RT reproducibility



Phase:	Proprietary
Max. temp.:	370 °C
USP listing:	NA

#### Thermo Scientific TraceGOLD TG-GlyceridesLB GC columns

ID (mm)	Length (m)	Film thickness (μm)	Quantity	Cat. no.
0.25	25	0.10	Each	26051-4590

#### Applications:

- Mono- and diglycerides

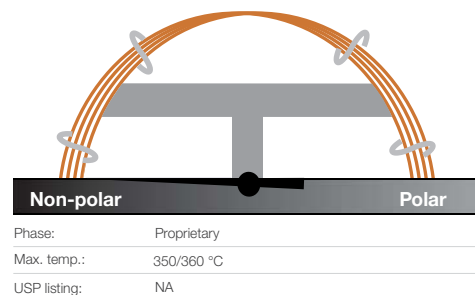
# Application-specific columns

## for polycyclic aromatic hydrocarbons (PAHs)

### Thermo Scientific™ TraceGOLD™ TG-PAH GC Columns

Application-specific column for polycyclic aromatic hydrocarbons

- Maximize resolution for fast analysis of regulated PAHs
- Low column bleed



#### Thermo Scientific TraceGOLD TG-PAH GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.18	40	0.07	Each	<a href="#">26055-3570</a>
0.25	30	0.10	Each	<a href="#">26055-0470</a>
0.25	60	0.10	Each	<a href="#">26055-0120</a>

#### Application:

- PAHs

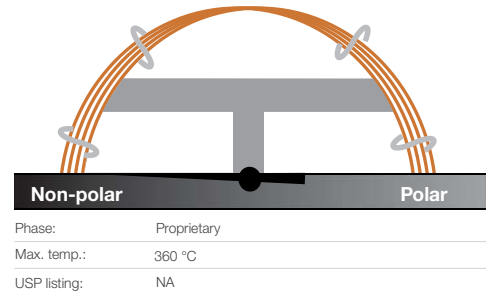
# Application-specific columns

## for polybrominated diphenyl ethers (PBDEs)

### Thermo Scientific™ TraceGOLD™ TG-PBDE GC Columns

Application-specific column for polybrominated diphenyl ethers

- Maximize resolution for fast analysis of PBDEs
- Excellent separation of critical pair BDE-49 & -71
- Low breakdown of BDE-209

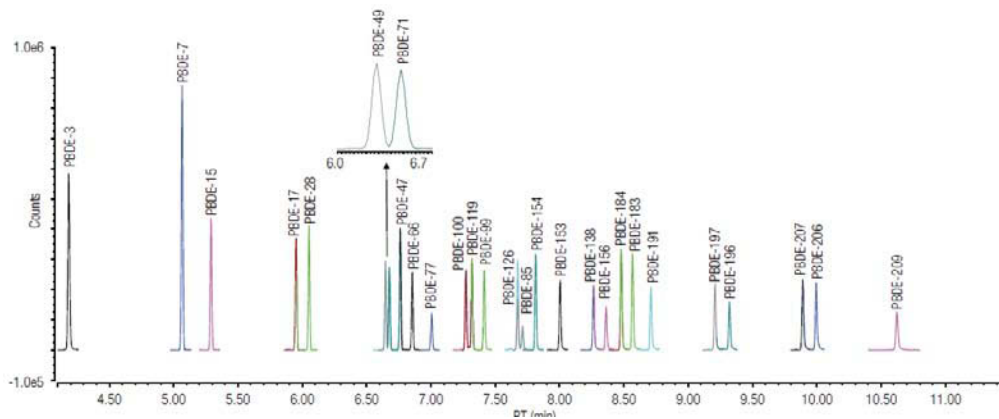


### Thermo Scientific TraceGOLD TG-PBDE GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.10	Each	<a href="#">26061-0350</a>

### Application:

- PBDEs





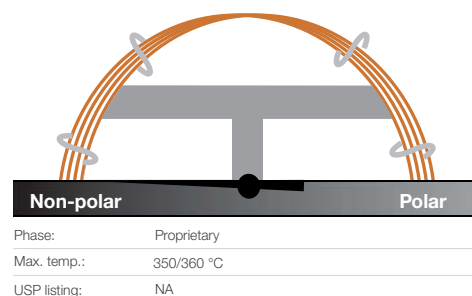
# Application-specific columns

## for polychlorinated biphenyls (PCBs)

### Thermo Scientific™ TRACE™ TR-PCB 8MS Columns

Application-specific column for polychlorinated biphenyls

- Meets the requirements for HR GC-MS analysis of PCBs



Phase:	Proprietary
Max. temp.:	350/360 °C
USP listing:	NA

#### Thermo Scientific TRACE TR-PCB 8MS GC columns

ID (mm)	Length (m)	Film thickness (μm)	Quantity	Cat. no.
0.25	50	0.25	Each	<a href="#">26AJ148P</a>

#### Application:

- PCBs



# Application-specific columns

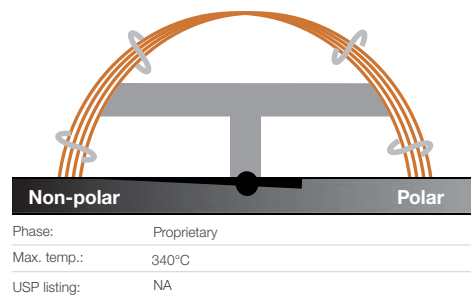
## for dioxin and furan

### Thermo Scientific™ TraceGOLD™ TG-Dioxin GC Columns

### Thermo Scientific™ TRACE™ TR-Dioxin 5MS GC Columns

#### Application-specific columns for 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



#### Thermo Scientific TraceGOLD TG-Dioxin GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.18	40	0.18	Each	<a href="#">26066-4800</a>
0.25	60	0.25	Each	<a href="#">26066-1540</a>

#### Applications:

- Dioxins
- Furans

#### Similar to:

- Rtx-Dioxin2
- DB-Dioxin

#### Thermo Scientific TRACE TR-Dioxin 5MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	60	0.25	Each	<a href="#">26AF154P</a>
0.25	30	0.10	Each	<a href="#">26AF047P</a>
0.25	60	0.10	Each	<a href="#">26AF059P</a>

# Application-specific columns

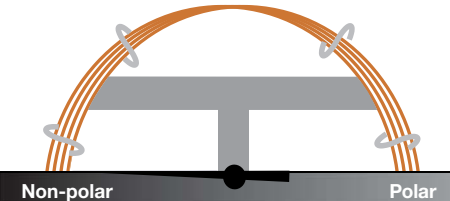
## for contaminants

### Thermo Scientific™ TraceGOLD™ TG-XLBMS GC Columns

### Thermo Scientific™ TraceGOLD™ TG-Contaminants 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. temp.:	340°C/360°C
USP listing:	NA

#### Thermo Scientific TraceGOLD TG-XLBMS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.18	20	0.18	Each	<a href="#">26079-5780</a>
	15	0.25	Each	<a href="#">26079-1300</a>
0.25	30	0.25	Each	<a href="#">26079-1420</a>
		0.5	Each	<a href="#">26079-2230</a>
	60	0.25	Each	<a href="#">26079-1540</a>
0.32	30	0.25	Each	<a href="#">26079-1430</a>
	60	0.25	Each	<a href="#">26079-1550</a>

#### Applications

- Pesticides
- PCB congeners
- PAHs
- Aroclor mixes

#### Similar to:

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

#### Thermo Scientific TraceGOLD TG-Contaminants GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.10	Each	<a href="#">26056-0350</a>

# Application-specific columns

for blood alcohol analysis and postmortem examination

## Thermo Scientific™ TraceGOLD™ TG-ALC Plus I GC Columns

## Thermo Scientific™ TraceGOLD™ TG-ALC Plus II GC Columns

Application-specific columns for blood alcohol analysis and postmortem examination

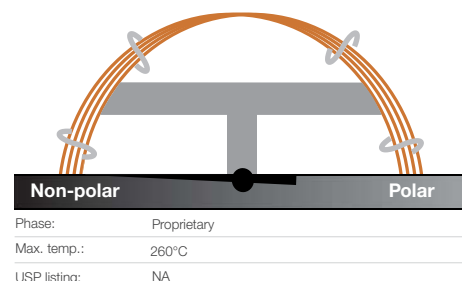
- Low bleed for excellent signal-to-noise ratio, sensitivity and mass spectral integrity
- Fast analysis time giving full separation of blood alcohols

### Thermo Scientific TraceGOLD TG-ALC Plus I GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.32	30	1.8	Each	<a href="#">26063-3390</a>
0.53	30	3.0	Each	<a href="#">26063-3960</a>

### Thermo Scientific TraceGOLD TG-ALC Plus II GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.32	30	0.6	Each	<a href="#">26063-2240</a>
0.53	30	1.0	Each	<a href="#">26063-2980</a>



### Applications:

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

### Similar to:

- Rtx BAC Plus 1
- Rtx BAC Plus 2

## Thermo Scientific™ TraceGOLD™ TG-ALC 1 GC Columns

## Thermo Scientific™ TraceGOLD™ TG-ALC 2 GC Columns

Application-specific columns for standard blood alcohol analysis

- Standard method
- Enhanced sensitivity and reproducibility

### Thermo Scientific TraceGOLD TG-ALC 1 GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.32	30	1.8	Each	<a href="#">26074-3390</a>

### Thermo Scientific TraceGOLD TG-ALC 2 GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.32	30	1.2	Each	<a href="#">26073-2260</a>



# Application-specific columns

## for drugs of abuse

### Thermo Scientific™ TRACE™ TR-DoA 35MS GC Columns

### Thermo Scientific™ TRACE™ TR-DoA 5MS GC Columns

#### Application-specific columns for drugs of abuse

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

#### Thermo Scientific TRACE TR-DoA GC columns

Phase	ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
TR-DoA35	0.20	15	0.33	Each	<a href="#">26AC497P</a>
TR-DoA5	0.25	15	0.25	Each	<a href="#">26AF130P</a>

#### Applications:

- Amphetamines, codeine, and morphine

# Application-specific columns for petrochemical

Thermo Scientific™ TRACE™ TR-BioDiesel GC Columns

Thermo Scientific™ TraceGOLD™ TG-TCEP GC Columns

Thermo Scientific™ TRACE™ TR-SimDist GC Columns

Thermo Scientific™ TraceGOLD™ TG-DHA50 GC Columns

Application-specific columns for petrochemical

- 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

## Thermo Scientific GC columns

Phase	Method	ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
TR-BioDiesel (M)	EN 14110	0.32	30	3.0	Each	<a href="#">26AA395P</a>
TR-BioDiesel (G)	EN 14105	0.32	10	0.1	Each	<a href="#">26AF024P</a>
TR-BioDiesel (F)	EN 14103	0.25	30	0.25	Each	<a href="#">26AX142P</a>
TG-BioDiesel (metal)	D6584	0.32	15	0.1	Each	26MB9-1930
TG-TCEP	D4815	0.25	30	0.4	Each	26069-5150
TR-SimDist	ASTM D2887	0.53	10	2.65	Each	260S348P
TG-DHA50	ASTM D6730	0.20	50	0.50	Each	26099-0410

# Application-specific columns

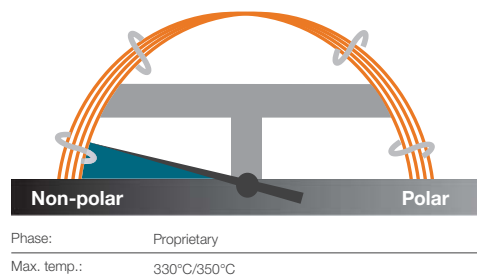
## for system qualification

### Thermo Scientific™ TraceGOLD™ TG-SQC GC Columns

### Thermo Scientific™ TRACE™ TR-5 GC Columns

#### System qualification GC columns

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



#### Thermo Scientific TraceGOLD TG-SQC GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.25	Each	<a href="#">26070-1300</a>
	30	0.25	Each	<a href="#">26070-1420</a>

#### Thermo Scientific TRACE TR-5 GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.32	7	0.25	Each	<a href="#">260E113P</a>

#### Applications:

- System qualification tests



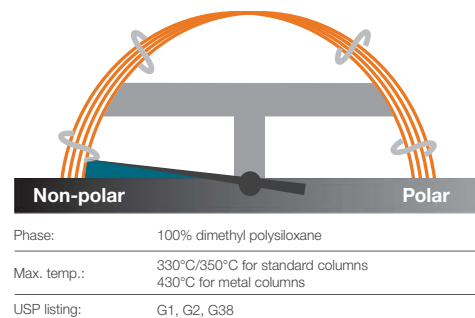
# WCOT capillary columns

## Low polarity

### Thermo Scientific™ TraceGOLD™ TG-1MS GC Columns

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

- Non-polar
- Ultra-low bleed
- Equivalent to USP G2



#### Thermo Scientific TraceGOLD TG-1MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.	
0.10	10	0.1	Each	<a href="#">26099-0200</a>	
0.20	12	0.33	Each	<a href="#">26099-5820</a>	
0.15	10	0.1	Each	<a href="#">26099-1910</a>	
	10	2.0	Each	<a href="#">26099-0290</a>	
	20	0.15	Each	<a href="#">26099-2760</a>	
	40	0.15	Each	<a href="#">26099-2940</a>	
0.18	20	0.18	Each	<a href="#">26099-5780</a>	
	20	0.4	Each	<a href="#">26099-5680</a>	
0.25	15	0.25	Each	<a href="#">26099-1300</a>	
		0.5	Each	<a href="#">26099-2110</a>	
		1.0	Each	<a href="#">26099-2840</a>	
	30	0.25	Each	<a href="#">26099-1420</a>	
		0.5	Each	<a href="#">26099-2230</a>	
		1.0	Each	<a href="#">26099-2960</a>	
	60	30 with 5 m SafeGuard	0.25	Each	<a href="#">26099-1425</a>
			0.25	Each	<a href="#">26099-1540</a>
		0.5	Each	<a href="#">26099-2350</a>	
		1.0	Each	<a href="#">26099-3080</a>	
100		0.5	Each	<a href="#">26099-3590</a>	

#### 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-1MS GC columns (continued)

### Thermo Scientific TraceGOLD TG-1MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.	
0.32	15	0.1	Each	26099-0360	
		0.25	Each	<a href="#">26099-1310</a>	
		1.0	Each	<a href="#">26099-2850</a>	
		3.0	Each	26099-3500	
	30	0.25	0.25	Each	<a href="#">26099-1430</a>
			0.5	Each	<a href="#">26099-2240</a>
			1.0	Each	<a href="#">26099-2970</a>
		3.0	3.0	Each	<a href="#">26099-4840</a>
			5.0	Each	26099-3050
			0.25	Each	<a href="#">26099-1550</a>
	60	0.5	0.5	Each	<a href="#">26099-2360</a>
			1.0	Each	<a href="#">26099-3090</a>
3.0		3.0	Each	26099-6520	
		0.5	Each	<a href="#">26099-2130</a>	
0.53	15	1.0	Each	<a href="#">26099-2860</a>	
		1.5	Each	<a href="#">26099-3340</a>	
		0.5	Each	<a href="#">26099-2250</a>	
	30	1.0	1.0	Each	<a href="#">26099-2980</a>
			1.5	Each	<a href="#">26099-3360</a>
		3.0	3.0	Each	26099-3960
			5.0	Each	26099-3530
		30 with 5 m SafeGuard	1.0	Each	<a href="#">26099-2985</a>
	60	5.0	Each	26099-4100	

## Thermo Scientific™ TraceGOLD™ TG-1MT Metal GC Columns

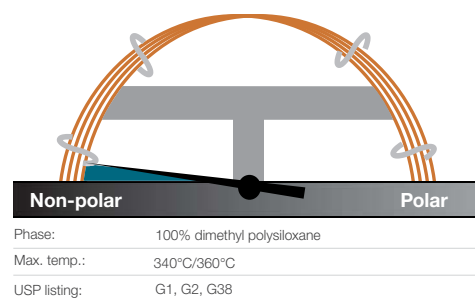
### Thermo Scientific TraceGOLD TG-1MT Metal GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.25	Each	<a href="#">26M99-1300</a>
	30	0.25	Each	<a href="#">26M99-1420</a>
0.53	12	1.0	Each	26M99-0710
		2.65	Each	<a href="#">26M99-3480</a>
	5	0.1	Each	<a href="#">26M99-4130</a>
		0.88	Each	<a href="#">26M99-4120</a>

## Thermo Scientific™ TRACE™ TR-1 GC Columns

Designed for method development

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



### Thermo Scientific TRACE TR-1 GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.25	Each	<a href="#">260A130P</a>
	30	0.1	Each	<a href="#">260A047P</a>
		0.25	Each	<a href="#">260A142P</a>
	60	0.25	Each	<a href="#">260A154P</a>
0.32	15	0.25	Each	<a href="#">260A131P</a>
	30	0.25	Each	<a href="#">260A143P</a>

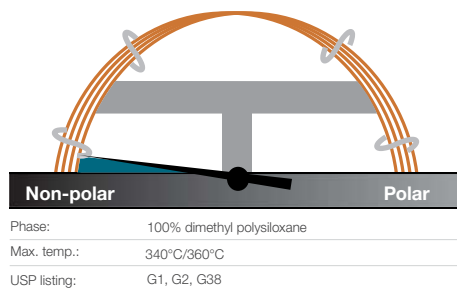
#### Applications:

- Chlorinated and nitroaromatic compounds
- Environmental analyses

## Thermo Scientific™ TRACE™ TR-1MS GC Columns

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



### Thermo Scientific TRACE TR-1MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.1	Each	<a href="#">260B047P</a>
		0.25	Each	<a href="#">260B142P</a>
	60	0.25	Each	<a href="#">260B154P</a>
0.32	30	0.25	Each	<a href="#">260B143P</a>
	60	0.25	Each	<a href="#">260B155P</a>
		1.0	Each	<a href="#">260B309P</a>

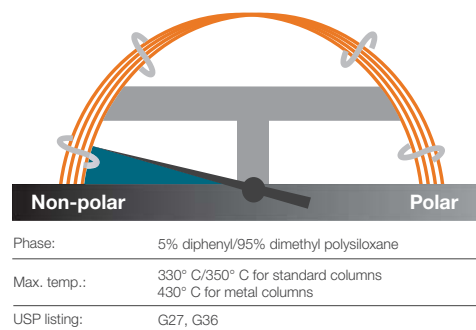
#### Applications:

- Chlorinated and nitroaromatic compounds
- GC-MS environmental analyses

# Thermo Scientific™ 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



## Thermo Scientific TraceGOLD TG-5MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.10	10	0.1	Each	<a href="#">26098-0200</a>
0.15	20	0.15	Each	<a href="#">26098-2760</a>
	40	0.15	Each	<a href="#">26098-2940</a>
0.18	20	0.18	Each	<a href="#">26098-5780</a>
	20 with 5 m SafeGuard	0.18	Each	<a href="#">26098-5785</a>
	15	0.25	Each	<a href="#">26098-1300</a>
	15 with 5 m SafeGuard	0.25	Each	<a href="#">26098-1305</a>
0.25	30	0.25	Each	<a href="#">26098-1420</a>
		0.5	Each	<a href="#">26098-2230</a>
	30 with 5 m SafeGuard	1.0	Each	<a href="#">26098-2960</a>
		0.1	Each	<a href="#">26098-0475</a>
0.25	30 with 10 m SafeGuard	0.25	Each	<a href="#">26098-1425</a>
		0.25	Each	<a href="#">26098-1421</a>
	60	0.25	Each	<a href="#">26098-1540</a>
		0.5	Each	<a href="#">26098-2350</a>
		1.0	Each	<a href="#">26098-3080</a>

### Applications:

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

### Similar to:

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

## TraceGOLD TG-5MS GC columns (continued)

## TraceGOLD TG-5MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.	
0.32	15	1.0	Each	<a href="#">26098-2850</a>	
		0.25	Each	26098-1310	
	30	0.25	Each	<a href="#">26098-1430</a>	
		0.5	Each	<a href="#">26098-2240</a>	
		1.0	Each	<a href="#">26098-2970</a>	
		30 with 5 m SafeGuard	0.25	Each	<a href="#">26098-1435</a>
	60	0.25	Each	<a href="#">26098-1550</a>	
		0.5	Each	<a href="#">26098-2360</a>	
		1.0	Each	<a href="#">26098-3090</a>	
		1.5	Each	26098-2320	
0.53	15	0.5	Each	<a href="#">26098-2130</a>	
		1.0	Each	<a href="#">26098-2860</a>	
		1.5	Each	<a href="#">26098-3340</a>	
	30	0.25	Each	<a href="#">26098-1440</a>	
		0.5	Each	<a href="#">26098-2250</a>	
		1.0	Each	<a href="#">26098-2980</a>	
		1.5	Each	<a href="#">26098-3360</a>	
		5.0	Each	26098-3530	
		60	5.0	Each	<a href="#">26098-4100</a>

## Thermo Scientific™ TraceGOLD™ TG-5MT Metal GC Columns

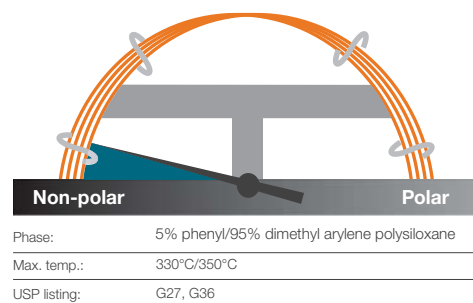
## Thermo Scientific TraceGOLD TG-5MT Metal GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.1	Each	<a href="#">26M98-0350</a>
	30	0.1	Each	26M98-0470
		0.25	Each	<a href="#">26M98-1420</a>
		60	0.25	Each

# Thermo Scientific™ TraceGOLD™ TG-5SiIMS GC Columns

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

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



## Thermo Scientific TraceGOLD TG-5SiIMS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.1	10	0.1	Each	<b>26096-0200</b>
0.15	20	0.15	Each	<a href="#">26096-2760</a>
0.18	20	0.18	Each	<a href="#">26096-5780</a>
0.25	15	0.25	Each	<a href="#">26096-1300</a>
	15 with 10 m SafeGuard	0.25	Each	<a href="#">26096-1301</a>
	30	0.25	Each	<a href="#">26096-1420</a>
		0.5	Each	<a href="#">26096-2230</a>
	30 with 5 m SafeGuard	1.0	Each	<a href="#">26096-2960</a>
		0.25	Each	<a href="#">26096-1425</a>
0.5		Each	<a href="#">26096-2235</a>	
30 with 10 m SafeGuard	0.25	Each	<a href="#">26096-1421</a>	
	0.25	Each	<a href="#">26096-1540</a>	
60	0.25	Each	<a href="#">26096-1540</a>	
	1.0	Each	<a href="#">26096-3080</a>	
0.32	30	0.25	Each	<a href="#">26096-1430</a>
		0.5	Each	<a href="#">26096-2240</a>
		1.0	Each	<a href="#">26096-2970</a>
0.53	30	1.5	Each	<a href="#">26096-3360</a>

### Applications:

- GC-MS applications
- Polycyclic aromatics
- Hydrocarbons including chlorinated hydrocarbons
- Phthalates
- Phenols
- Amines
- Organophosphate

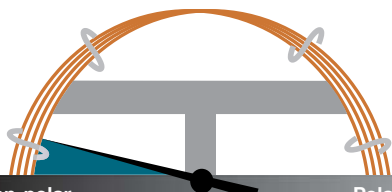
### Similar to:

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

## Thermo Scientific™ 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. temp.:	380°C/400°C
USP listing:	G27, G36

### Thermo Scientific TraceGOLD TG-5HT GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.1	Each	<a href="#">26095-0350</a>
		0.25	Each	<a href="#">26095-1300</a>
	30	0.1	Each	<a href="#">26095-0470</a>
		0.25	Each	<a href="#">26095-1420</a>
0.32	15	0.1	Each	<a href="#">26095-0360</a>
	30	0.1	Each	<a href="#">26095-0480</a>
		0.25	Each	<a href="#">26095-1430</a>
0.53	10	0.15	Each	<a href="#">26095-1640</a>
	30	0.15	Each	<a href="#">26095-0620</a>

#### Applications:

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

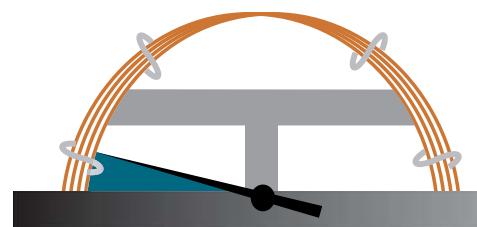
#### Similar to:

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

# Thermo Scientific™ 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. temp.:	300°C/315°C
USP listing:	NA

## Thermo Scientific TraceGOLD TG-5MS AMINE GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.25	Each	<a href="#">26097-1300</a>
		1.0	Each	<a href="#">26097-2840</a>
	30	0.25	Each	<a href="#">26097-1420</a>
		1.0	Each	<a href="#">26097-2960</a>
0.32	30	1.0	Each	<a href="#">26097-2970</a>
0.53	30	1.0	Each	<a href="#">26097-2980</a>
		3.0	Each	<a href="#">26097-3960</a>

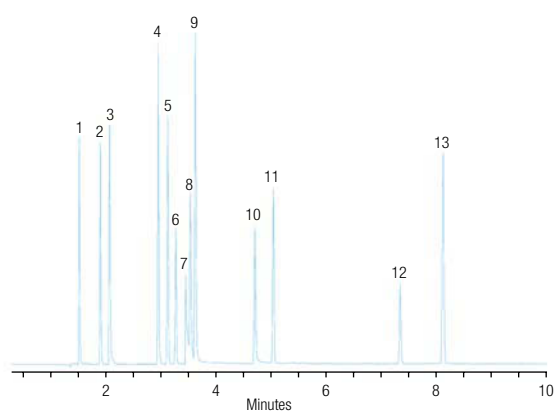
### Applications:

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

### Similar to:

- Rtx-5 Amine

## Amines and phenols



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

Temperature:	120 °C to 220 °C at 10 °C/minute
Detector type:	FID
Carrier gas:	Hydrogen
Flow rate:	40 cm/min
Injection volume:	1.0 µL
Injection mode:	Split 25:1, 300 °C

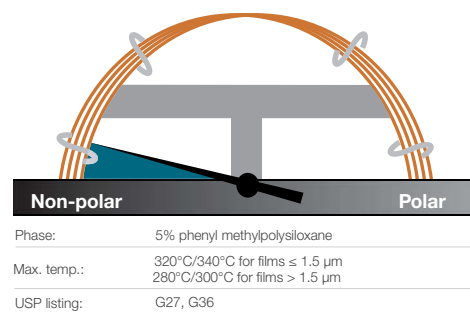
1. diethylamine	8. octylamine
2. pyridine	9. 1-methyl-2-pyrrolidone
3. morpholine	10. 2-nitrophenol
4. phenol	11. 2,6-dimethylaniline
5. aniline	12. nicotine
6. 2-chlorophenol	13. 2-nitroaniline
7. diethylenetriamine	



## Thermo Scientific™ TRACE™ TR-5 GC Columns

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

- Low polarity phase, 5% phenyl methyl polysiloxane
- Widely used in a variety of applications



### Thermo Scientific TRACE TR-5 GC columns

ID (mm)	Length (m)	Film thickness (μm)	Quantity	Cat. no.
0.25	15	0.25	Each	<a href="#">260E130P</a>
	30	0.25	Each	<a href="#">260E142P</a>
	60	0.25	Each	<a href="#">260E154P</a>
0.32	7	0.25	Each	<a href="#">260E113P</a>
	15	0.25	Each	<a href="#">260E131P</a>
	30	0.25	Each	<a href="#">260E143P</a>
		0.5	Each	<a href="#">260E224P</a>
		1.0	Each	<a href="#">260E297P</a>
60	0.25	Each	<a href="#">260E155P</a>	
100	0.5	Each	<a href="#">260E242P</a>	
0.53	30	0.5	Each	<a href="#">260E225P</a>
		1.0	Each	<a href="#">260E298P</a>
		1.5	Each	<a href="#">260E336P</a>
		5.0	Each	<a href="#">260E470P</a>

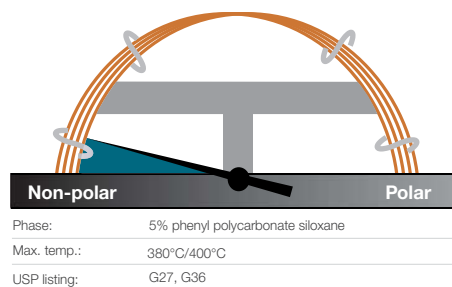
#### Applications:

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

## Thermo Scientific™ TRACE™ TR-5HT GC Columns

Feature upper temperature limits as high as 400 °C

- Low polarity phase, 5% phenyl polycarbonate siloxane
- Allow the elution of higher-boiling hydrocarbons up to 100 °C
- Low bleed even at elevated temperatures



### Thermo Scientific TRACE TR-5HT GC columns

ID (mm)	Length (m)	Film thickness (μm)	Quantity	Cat. no.
0.25	15	0.1	Each	<a href="#">260H035P</a>
	30	0.1	Each	<a href="#">260H047P</a>
		0.25	Each	<a href="#">260H142P</a>
0.32	12	0.1	Each	<a href="#">260H030P</a>

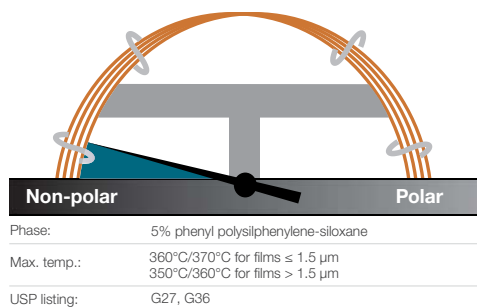
#### Applications:

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

# Thermo Scientific™ TRACE™ TR-5MS GC Columns

Features a popular GC-MS phase for many applications

- Low polarity phase, 5% phenyl polysilphenylene-siloxane
- High operating temperature and stability
- High signal-to-noise ratio for increased sensitivity
- High robustness to oxygen and water contamination



## Thermo Scientific TRACE TR-5MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.10	10	0.1	Each	<a href="#">260F020P</a>
0.18	20	0.18	Each	<a href="#">260F578P</a>
	15	0.1	Each	<a href="#">260F035P</a>
		0.25	Each	<a href="#">260F130P</a>
		0.1	Each	<a href="#">260F047P</a>
		0.25	Each	<a href="#">260F142P</a>
0.25	30	0.25 (with guard)	Each	<a href="#">260F142J</a>
		0.5	Each	<a href="#">260F223P</a>
		1.0	Each	<a href="#">260F296P</a>
		0.25	Each	<a href="#">260F154P</a>
		1.0	Each	<a href="#">260F308P</a>
0.32	30	1.0	Each	<a href="#">260F285P</a>
		0.25	Each	<a href="#">260F143P</a>
		0.5	Each	<a href="#">260F224P</a>
	60	1.0	Each	<a href="#">260F297P</a>
		1.0	Each	<a href="#">260F309P</a>
		0.5	Each	<a href="#">260F225P</a>
0.53	30	1.0	Each	<a href="#">260F298P</a>
		1.5	Each	<a href="#">260F336P</a>
		3.0	Each	<a href="#">260F396P</a>

### Applications:

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

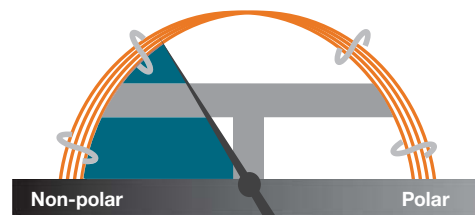
# WCOT capillary columns

## Mid polarity

### Thermo Scientific™ TraceGOLD™ TG-35MS GC Columns

Higher phenyl content for useful elution order and retention time changes

- Mid-polarity phase
- Equivalent to USP G42 phase
- High temperature stability
- Very low bleed



The diagram shows a cross-section of a capillary column with a gradient from non-polar to polar phases. The left side is labeled 'Non-polar' and the right side is labeled 'Polar'. The column is supported by a metal frame.

Phase:	35% diphenyl/65% dimethyl arylene polysiloxane
Max. temp.	340°C/360°C
USP listing:	G42

#### Thermo Scientific TraceGOLD TG-35MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.18	20	0.18	Each	<b>26094-5780</b>
	15	0.25	Each	<a href="#">26094-1300</a>
0.25	30	0.25	Each	<a href="#">26094-1420</a>
		0.5	Each	<a href="#">26094-2230</a>
0.32	30	0.25	Each	<a href="#">26094-1430</a>
		0.5	Each	<a href="#">26094-2240</a>
0.53	15	0.5	Each	<a href="#">26094-2130</a>
	30	1.0	Each	<a href="#">26094-2980</a>
		1.5	Each	<a href="#">26094-3360</a>

#### Applications:

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

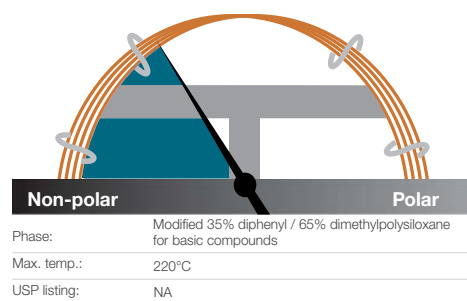
#### Similar to:

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

# Thermo Scientific™ 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



## Thermo Scientific TraceGOLD TG-35MS AMINE GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.5	Each	<a href="#">26092-2230</a>
		1.0	Each	<a href="#">26092-2960</a>
0.32	30	1.0	Each	<a href="#">26092-2970</a>
		1.5	Each	<a href="#">26092-3350</a>
0.53	15	1.0	Each	<a href="#">26092-2860</a>
	30	1.0	Each	<a href="#">26092-2980</a>

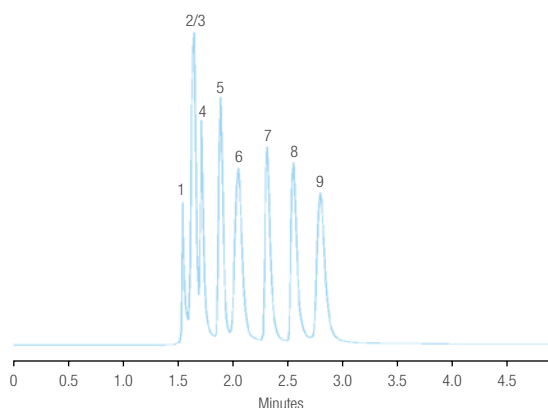
### Applications:

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

### Similar to:

- Rtx-35 Amine

## Primary amines



### TraceGOLD TG-35MS AMINE column

30 m x 0.53 mm x 1.0 µm

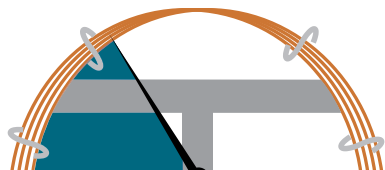
Temperature:	35 °C (5 minute hold) Isothermal
Detector type:	FID
Carrier gas:	He
Flow rate:	35 cm/sec
Injection volume:	1.0 µL
Injection mode:	Split (10:1), 250 °C

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

## Thermo Scientific™ 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



Non-polar		Polar	
Phase:	35% phenyl polysilphenylene-siloxane		
Max. temp.:	330°C/360°C		
USP listing:	G42		

### Thermo Scientific TRACE TR-35MS GC columns

ID (mm)	Length (m)	Film thickness (μm)	Quantity	Cat. no.
0.25	30	0.25	Each	<a href="#">260C142P</a>
	60	0.25	Each	<a href="#">260C154P</a>
0.53	15	1.0	Each	<a href="#">260C286P</a>

#### Applications:

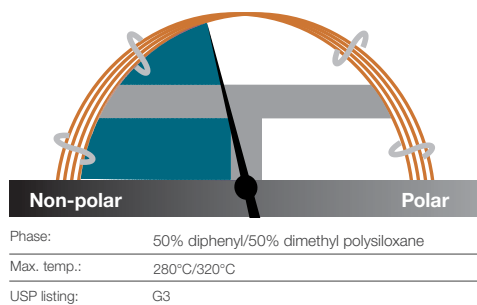
- Pesticides
- Herbicides
- Drugs of abuse
- PAHs
- Pharmaceuticals



# Thermo Scientific™ 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



## Thermo Scientific TraceGOLD TG-17MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.25	Each	<a href="#">26089-1300</a>
		0.25	Each	<a href="#">26089-1420</a>
	30	0.5	Each	<a href="#">26089-2230</a>
		1.0	Each	<a href="#">26089-2960</a>
0.32	30	0.25	Each	<a href="#">26089-1540</a>
		0.5	Each	<a href="#">26089-1430</a>
		1.0	Each	<a href="#">26089-2970</a>
0.53	30	0.25	Each	<a href="#">26089-1440</a>
		1.0	Each	<a href="#">26089-2980</a>
		1.5	Each	<a href="#">26089-3360</a>

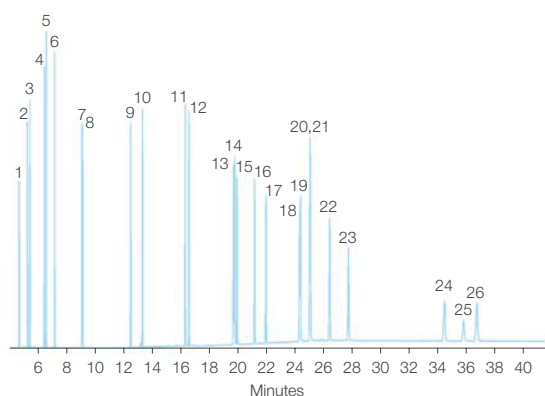
### Applications:

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

### Similar to:

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

## Polycyclic aromatic hydrocarbons



### TraceGOLD TG-17MS column

30 m x 0.25 mm x 0.25 µm

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: 1.2 mL/min

Injection volume: 1.0 µL

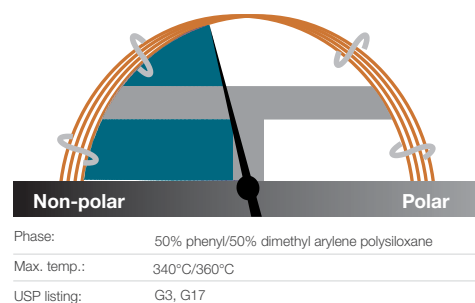
Injection mode: Splitless, 300 °C

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

## Thermo Scientific™ TraceGOLD™ TG-17SiIMS GC Columns

Excellent separation of active environmental compounds

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



### Thermo Scientific TraceGOLD TG-17SiIMS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.15	10	0.15	Each	<a href="#">26072-2750</a>
0.18	20	0.18	Each	<a href="#">26072-5780</a>
0.25	30	0.25	Each	<a href="#">26072-1420</a>
	60	0.25	Each	<a href="#">26072-1540</a>
0.32	30	0.25	Each	<a href="#">26072-1430</a>

#### Applications:

- PAHs
- Pesticides and herbicides
- Phthalate ester
- Triglycerides

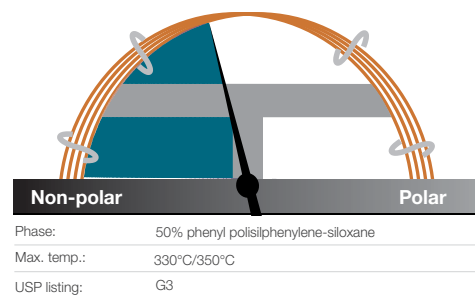
#### Similar to:

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

## Thermo Scientific™ 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



### Thermo Scientific TRACE TR-50MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	<a href="#">260R142P</a>
0.32	30	0.25	Each	<a href="#">260R143P</a>

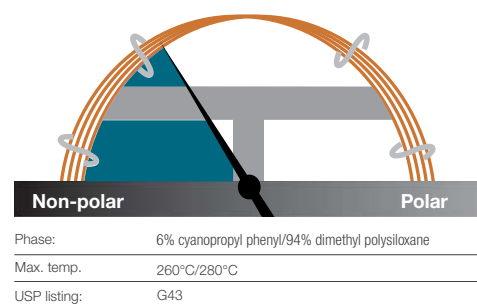
#### Applications:

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

# Thermo Scientific™ 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



## Thermo Scientific TraceGOLD TG-1301MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	<a href="#">26091-1420</a>
		1.0	Each	<a href="#">26091-2960</a>
	60	0.25	Each	<a href="#">26091-1540</a>
		1.0	Each	<a href="#">26091-3080</a>
0.32	30	0.25	Each	<a href="#">26091-1430</a>
		1.0	Each	<a href="#">26091-2970</a>
		1.5	Each	<a href="#">26091-3350</a>
		1.8	Each	<a href="#">26091-3390</a>
0.53	60	1.8	Each	<a href="#">26091-3410</a>
		1.0	Each	<a href="#">26091-2980</a>
		3.0	Each	<a href="#">26091-3960</a>
	60	3.0	Each	<a href="#">26091-4080</a>

### Applications:

- Alcohols
- Volatile organics
- Oxygenates
- Residual solvents

### Similar to:

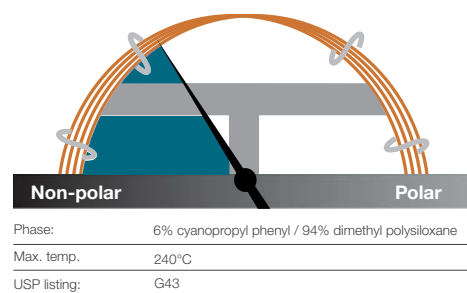
- Rtx-1301
- DB-1301
- BP-624
- HP-1301
- HP-624
- SPB-1301
- SPB-624
- VP-1301
- BF-624ms
- CP-1301
- CP-Select™ 624 CB



# Thermo Scientific™ TraceGOLD™ TG-624 GC Columns

Application-specific column for volatile organic pollutants

- 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



## Thermo Scientific TraceGOLD TG-624 GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.18	20	1.0	Each	<a href="#">26085-4950</a>
	40	1.0	Each	<a href="#">26085-4960</a>
0.25	30	1.4	Each	<a href="#">26085-3320</a>
	60	1.4	Each	<a href="#">26085-3330</a>
0.32	30	1.8	Each	<a href="#">26085-3390</a>
	60	1.8	Each	<a href="#">26085-3410</a>
0.53	30	3.0	Each	<a href="#">26085-3960</a>
	60	3.0	Each	<a href="#">26085-4080</a>
	75	3.0	Each	<a href="#">26085-4900</a>
	105	3.0	Each	<a href="#">26085-4090</a>

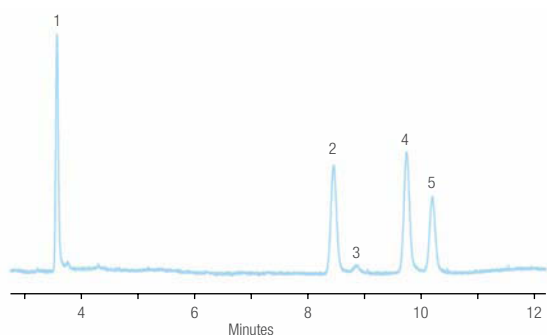
### Applications:

- 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



### TraceGOLD TG-624 columns

**30 m x 0.32 mm x 1.80 µm**

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

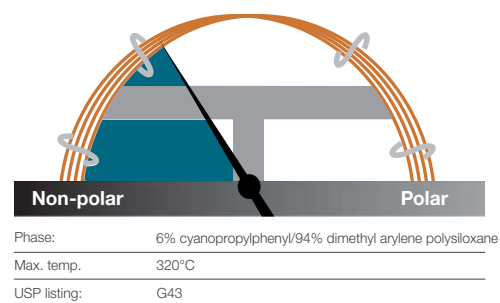
Detector type: FID  
Carrier gas: He  
Flow rate: 2.15 mL/min  
Injection volume: 1 µL  
Injection mode: Headspace, split (1:5), 140 °C

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

# Thermo Scientific™ TraceGOLD™ TG-624SiIMS GC Columns

Application-specific column for volatile organic pollutants

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



## Thermo Scientific TraceGOLD TG-624SiIMS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.18	20	1.0	Each	<a href="#">26059-4950</a>
0.25	30	1.4	Each	<a href="#">26059-3320</a>
	60	1.4	Each	<a href="#">26059-3330</a>
0.32	30	1.8	Each	<a href="#">26059-3390</a>
	60	1.8	Each	<a href="#">26059-3410</a>
0.53	30	3.0	Each	<a href="#">26059-3960</a>
	60	3.0	Each	<a href="#">26059-4080</a>

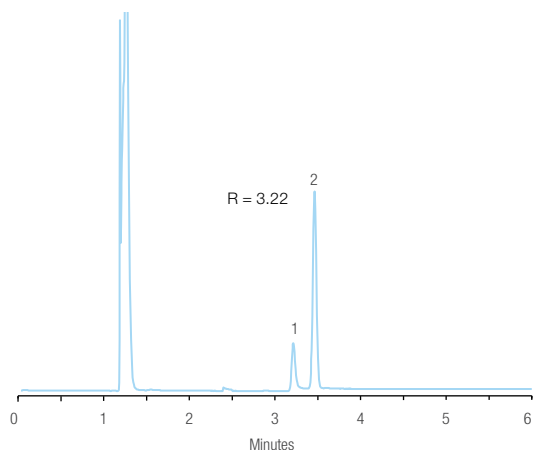
### Applications:

- Residual solvents
- Volatile organic compounds
- Alcohols
- Oxygenates

### Similar to:

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

## Acetonitrile and dichloromethane



### TraceGOLD TG-624SiIMS columns 30 m × 0.32 mm × 1.8 µm

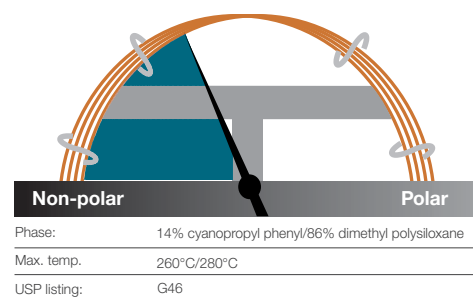
Temperature:	40 °C for 6 minutes
Detector type:	MS (ISQ); <i>m/z</i> 40,41 for Acetonitrile (1), <i>m/z</i> 49, 84 for Dichloromethane (2)
Carrier gas:	Helium
Flow rate:	1.5 mL/min
Injection volume:	500 µL
Injection mode:	Headspace, split (20:1) 220 °C

1. Acetonitrile
2. Dichloromethane

# Thermo Scientific™ 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 suitable for GC-MS
- Optimal for confirmation analysis
- Equivalent to USP G46 phase



## Thermo Scientific TraceGOLD TG-1701MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	<a href="#">26090-1420</a>
		0.5	Each	<a href="#">26090-2230</a>
		1.0	Each	<a href="#">26090-2960</a>
	60	0.5	Each	<a href="#">26090-2350</a>
		0.25	Each	<a href="#">26090-1540</a>
		1.0	Each	<a href="#">26090-3080</a>
0.32	15	0.25	Each	<a href="#">26090-1310</a>
	30	0.25	Each	<a href="#">26090-1430</a>
		0.5	Each	<a href="#">26090-2240</a>
		1.0	Each	<a href="#">26090-2970</a>
	60	0.25	Each	<a href="#">26090-1550</a>
		1.0	Each	<a href="#">26090-3090</a>
0.32		Each	<a href="#">26090-0630</a>	
0.53	30	0.25	Each	<a href="#">26090-1440</a>
		1.0	Each	<a href="#">26090-2980</a>
		3.0	Each	<a href="#">26090-3960</a>

### Applications:

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

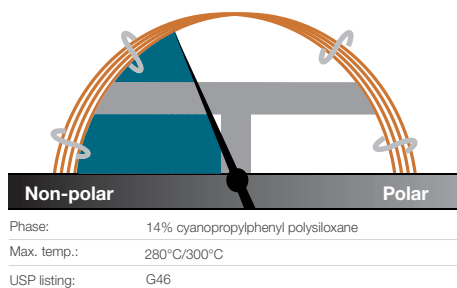
### Similar to:

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

## Thermo Scientific™ 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



### Thermo Scientific TRACE TR-1701 GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	<a href="#">260Q142P</a>
0.32	30	0.25	Each	<a href="#">260Q143P</a>
0.53	30	1.0	Each	<a href="#">260Q298P</a>

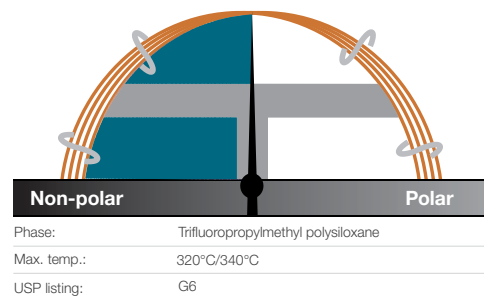
### Applications:

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

## Thermo Scientific™ 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 electron capture detector (ECD), nitrogen-phosphorus detector (NPD), and mass spectrometry (MS)
- Confirmation column in combination with another GC column



### Thermo Scientific TraceGOLD TG-200MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.15	20	0.15	Each	<a href="#">26084-2760</a>
0.25	30	0.25	Each	<a href="#">26084-1420</a>
		1.0	Each	<a href="#">26084-2960</a>
	60	1.0	Each	<a href="#">26084-3080</a>
0.32	30	0.25	Each	<a href="#">26084-1430</a>
		0.5	Each	<a href="#">26084-2240</a>
	60	1.0	Each	<a href="#">26084-2970</a>
		0.25	Each	<a href="#">26084-1550</a>
0.53	30	1.0	Each	<a href="#">26084-2980</a>

### Applications:

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

### Similar to:

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

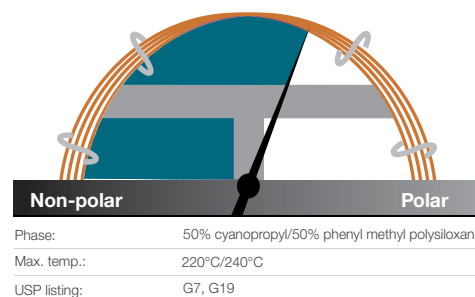
# WCOT capillary columns

## High polarity

### Thermo Scientific™ 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



#### Thermo Scientific TraceGOLD TG-225MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.25	Each	26083-1300
	30	0.25	Each	<a href="#">26083-1420</a>
	60	0.25	Each	<a href="#">26083-1540</a>
0.32	30	0.25	Each	<a href="#">26083-1430</a>

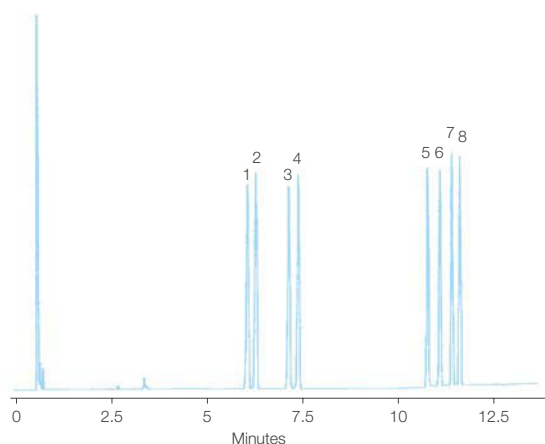
#### Applications:

- FAMES
- Carbohydrates
- Sterols
- Flavor compounds

#### Similar to:

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

#### Sugars



#### TraceGOLD TG-225MS column

15 m x 0.25 mm x 0.25 µm

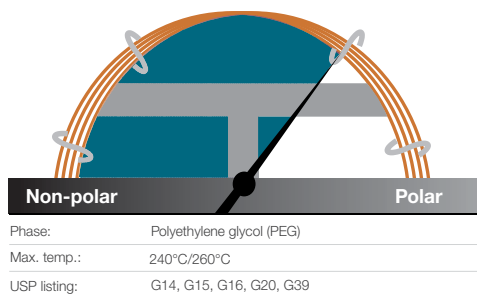
Temperature:	190 °C (5 minute hold) to 250 °C at 8 °C/min (5 minute hold)
Detector type:	FID
Carrier gas:	Hydrogen
Flow rate:	45 cm/sec
Injection volume:	0.5 µL
Injection mode:	Split (35:1), 260 °C

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

## Thermo Scientific™ 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



### Thermo Scientific TraceGOLD TG-WaxMS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.1	10	0.1	Each	<a href="#">26088-0200</a>
0.15	20	0.15	Each	<a href="#">26088-2760</a>
0.18	20	0.18	Each	<a href="#">26088-5780</a>
0.25	15	0.25	Each	<a href="#">26088-1300</a>
	30	0.25	Each	<a href="#">26088-1420</a>
	30	0.5	Each	<a href="#">26088-2230</a>
	30 m with 5 m SafeGuard	0.25	Each	<a href="#">26088-1421</a>
0.32	60	0.25	Each	<a href="#">26088-1540</a>
	60	0.5	Each	<a href="#">26088-2350</a>
	15	0.5	Each	<a href="#">26088-2120</a>
	30	0.25	Each	<a href="#">26088-1430</a>
0.53	30	0.5	Each	<a href="#">26088-2240</a>
		1.0	Each	<a href="#">26088-2970</a>
		1.0	Each	<a href="#">26088-1435</a>
	60	0.25	Each	<a href="#">26088-1550</a>
		0.5	Each	<a href="#">26088-2360</a>
		1.0	Each	<a href="#">26088-3090</a>
0.53	15	0.5	Each	<a href="#">26088-2130</a>
		1.0	Each	<a href="#">26088-2860</a>
		0.25	Each	<a href="#">26088-1440</a>
	30	0.5	Each	<a href="#">26088-2250</a>
		1.0	Each	<a href="#">26088-2980</a>
		1.5	Each	<a href="#">26088-3360</a>
60	0.25	Each	<a href="#">26088-1560</a>	
	0.5	Each	<a href="#">26088-2370</a>	
	1.0	Each	<a href="#">26088-3100</a>	

### 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

## Thermo Scientific™ TraceGOLD™ TG-WaxMT Metal GC Columns

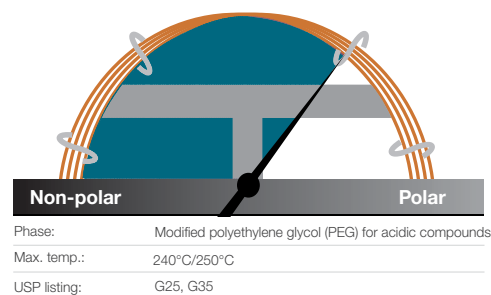
### Thermo Scientific TraceGOLD TG-WaxMT Metal GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	<a href="#">26M88-1420</a>
	60	0.25	Each	<a href="#">26M88-1540</a>

# Thermo Scientific™ 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 and G35 phases



## Thermo Scientific TraceGOLD TG-WaxMS A GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.25	Each	<a href="#">26087-1300</a>
	30	0.25	Each	<a href="#">26087-1420</a>
		0.5	Each	<a href="#">26087-2230</a>
0.32	60	0.25	Each	<a href="#">26087-1540</a>
	15	0.25	Each	<a href="#">26087-1310</a>
		0.25	Each	<a href="#">26087-1430</a>
0.5		Each	<a href="#">26087-2240</a>	
0.53	30	1.0	Each	<a href="#">26087-2970</a>
		1.0	Each	<a href="#">26087-2860</a>
		0.25	Each	<a href="#">26087-1440</a>
		1.0	Each	<a href="#">26087-2980</a>

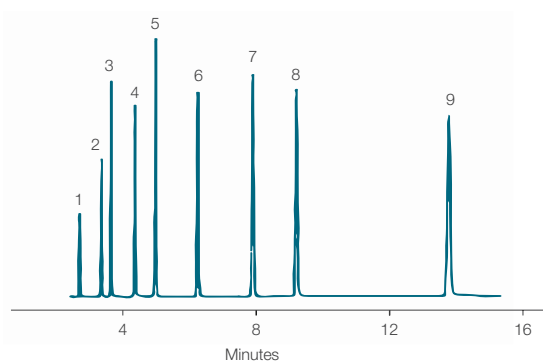
### Applications:

- 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



### TraceGOLD TG-WaxMS A column

30 m x 0.25 mm x 0.25 µm

Temperature: 145 °C Isothermal

Detector type: FID

Carrier gas: Hydrogen

Flow rate: 40 cm/sec

Injection volume: 1.0 µL

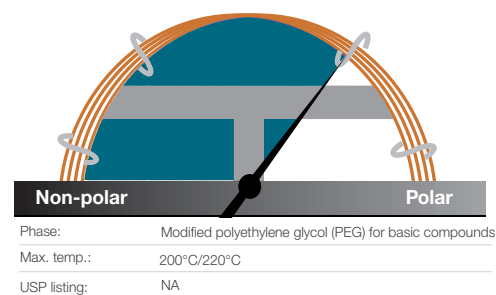
Injection mode: Split (50:1), 250 °C

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

# Thermo Scientific™ 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



## Thermo Scientific TraceGOLD TG-WaxMS B GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	<a href="#">26086-1420</a>
		0.5	Each	<a href="#">26086-2230</a>
0.32	30	0.25	Each	<a href="#">26086-1430</a>
0.53	30	1.0	Each	<a href="#">26086-2980</a>

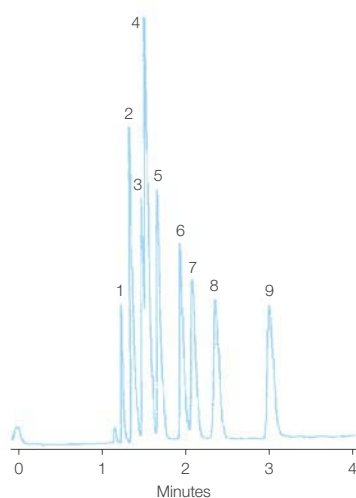
### Applications:

- Amines
- Alkylamines
- Diamines
- Other basic compounds

### Similar to:

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

### Amines



#### TraceGOLD TG-WaxMS B column

30 m x 0.53 mm x 1.0 µm

Temperature:	45 °C Isothermal
Detector type:	FID
Carrier gas:	Hydrogen
Flow rate:	40 cm/sec
Injection volume:	1 µL
Injection mode:	Direct Injection, 250 °C

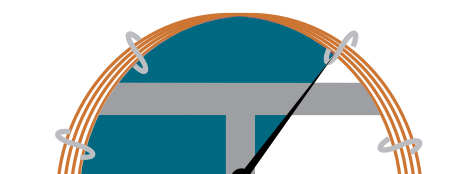
1. trimethylamine
2. dimethylamine
3. ethylamine
4. methylamine
5. isopropylamine
6. n-propylamine
7. tert-butylamine
8. diethylamine
9. sec-butylamine



## Thermo Scientific™ 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. temp.:	260°C/280°C for films < 1.0 µm 240°C/260°C for 1.0 µm films
USP listing:	G16, G20, G39

### Thermo Scientific TRACE TR-Wax GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	<a href="#">260W142P</a>
		0.5	Each	<a href="#">260W223P</a>
		1.0	Each	<a href="#">260W296P</a>
0.32	60	0.25	Each	<a href="#">260W154P</a>
		0.25	Each	<a href="#">260W143P</a>
		0.5	Each	<a href="#">260W224P</a>
0.32	30	1.0	Each	<a href="#">260W297P</a>
		0.25	Each	<a href="#">260W155P</a>
		1.0	Each	<a href="#">260W309P</a>
0.53	15	1.0	Each	<a href="#">260W286P</a>
		0.5	Each	<a href="#">260W225P</a>
		1.0	Each	<a href="#">260W298P</a>

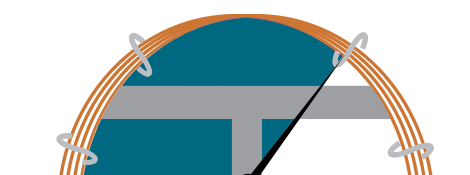
#### Applications:

- Esters
- Alcohols
- Ketones
- Glycols
- Aromatic isomers

## Thermo Scientific™ 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. temp.:	260°C/280°C
USP listing:	G16, G20, G39

### Thermo Scientific™ TRACE™ TR-WaxMS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	<a href="#">260X142P</a>
		1.0	Each	<a href="#">260X296P</a>
	60	0.25	Each	<a href="#">260X154P</a>
0.32	30	0.5	Each	<a href="#">260X224P</a>

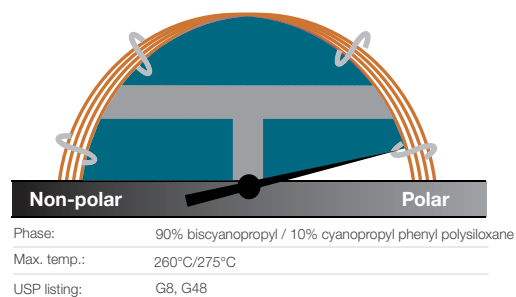
#### Applications:

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

# Thermo Scientific™ 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



## Thermo Scientific TraceGOLD TG-POLAR GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.1	Each	<a href="#">26082-0470</a>
		0.2	Each	<a href="#">26082-5010</a>
	60	0.1	Each	<a href="#">26082-0590</a>
		0.2	Each	<a href="#">26082-5020</a>
0.32	30	0.1	Each	<a href="#">26082-5000</a>
		0.2	Each	<a href="#">26082-5030</a>
	60	0.1	Each	<a href="#">26082-5040</a>
		0.2	Each	<a href="#">26082-5050</a>

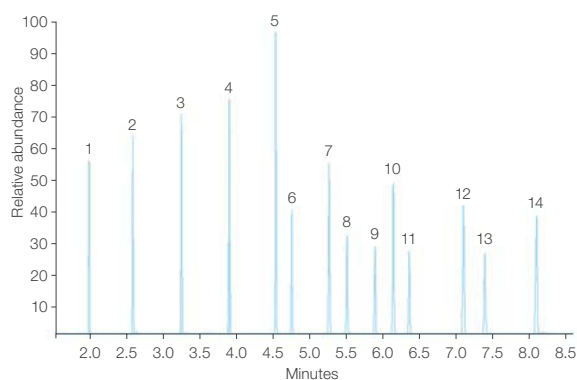
### Applications:

- 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



### TraceGOLD TG-POLAR column 30 m x 0.25 mm x 0.2 µm

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: 1.2 mL/min  
Injection volume: 0.1 µL  
Injection mode: Split (100:1), 250 °C

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

# PLOT capillary columns

## Thermo Scientific™ TracePLOT™ TG-BOND Alumina GC Columns: Na<sub>2</sub>SO<sub>4</sub> and KCl deactivation

Optimized for linear and quantitative analysis of polar unsaturated hydrocarbons

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

### Thermo Scientific TracePLOT TG-BOND Alumina GC columns

ID (mm)	Length (m)	Film thickness (μm)	Quantity	Cat. no.
<b>Na<sub>2</sub>SO<sub>4</sub> deactivation</b>				
0.32	30	5	Each	<a href="#">26001-6020</a>
	50	5	Each	<a href="#">26001-6050</a>
0.53	30	10	Each	<a href="#">26001-6080</a>
	50	10	Each	<a href="#">26001-6110</a>
<b>KCl deactivation</b>				
0.32	30	5	Each	<a href="#">26002-6020</a>
	50	5	Each	<a href="#">26002-6050</a>
0.53	30	10	Each	<a href="#">26002-6080</a>
	50	10	Each	<a href="#">26002-6110</a>

### Applications:

- C1-C5 hydrocarbons
- Unsaturated hydrocarbon isomers
- Temperature range: -60 °C to 200 °C

## Thermo Scientific™ TracePLOT™ TG-BOND Sieve 5A GC Columns

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

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

### Thermo Scientific TracePLOT TG-BOND Sieve 5A GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.32	15	30	Each	<a href="#">26003-6010</a>
	30	30	Each	<a href="#">26003-6040</a>
0.53	15	50	Each	<a href="#">26003-6070</a>
	30	50	Each	<a href="#">26003-6100</a>
	50	50	Each	<a href="#">26003-1630</a>

#### Applications:

- Permanent gases
- Refinery or natural gases
- Temperature range: -100 °C to 300 °C

## Thermo Scientific™ TracePLOT™ TG-BOND Q GC Columns

Non-polar columns for oxygenated compounds and solvents

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

### Thermo Scientific TracePLOT TG-BOND Q GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.32	15	10	Each	<a href="#">26004-6000</a>
	30	10	Each	<a href="#">26004-6030</a>
0.53	15	20	Each	<a href="#">26004-6060</a>
	30	20	Each	<a href="#">26004-6090</a>

#### Applications:

- C1 to C3 isomers and alkanes up to C12
- Separation of CO<sub>2</sub>, methane and O<sub>2</sub>/N<sub>2</sub>/CO
- Analysis of oxygenated compounds and solvents
- Temperature range: -60 °C to 280 °C/300 °C

## Thermo Scientific™ 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

### Thermo Scientific TracePLOT TG-BOND Q+ GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.32	15	10	Each	<a href="#">26005-6000</a>
	30	10	Each	<a href="#">26005-6030</a>
0.53	15	20	Each	<a href="#">26005-6060</a>
	30	20	Each	<a href="#">26005-6090</a>

#### Applications:

- Separation of ethane, ethylene and acetylene to baseline
- Temperature range: -60 °C to 250 °C

## Thermo Scientific™ 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

### Thermo Scientific TracePLOT TG-BOND S GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.32	15	10	Each	<a href="#">26006-6000</a>
	30	10	Each	<a href="#">26006-6030</a>
0.53	30	20	Each	<a href="#">26006-6090</a>

#### Applications:

- Non-polar and mid-polar compounds
- Temperature range: -60 °C to 250 °C

## Thermo Scientific™ 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

### Thermo Scientific TracePLOT TG-BOND U GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.32	15	10	Each	<a href="#">26007-6000</a>
	30	10	Each	<a href="#">26007-6030</a>
0.53	30	20	Each	<a href="#">26007-6090</a>

### Applications:

- Analysis of polar compounds
- Temperature range: -60 °C to 190 °C

## Thermo Scientific™ TracePLOT™ Particle Traps for GC instruments

Provides a safeguard from dislodged particles entering the detector

### Thermo Scientific TracePLOT particle traps for GC instruments

Description	ID (mm)	Quantity	Cat. no.
PLOT Particle Trap (2.5 m × 0.32 mm)	0.32	Each	<a href="#">60180-860</a>
PLOT Particle Trap (2.5 m × 0.53 mm)	0.53	Each	<a href="#">60180-861</a>

# Packed and micropacked columns

## Molecular sieves

Commonly used for separating permanent gases at above-ambient temperatures

### Molsieve 5A packed columns

Description	Length (m)	Inner diameter (ID, mm)	Outer diameter (OD, inch)	Mesh	Quantity	Cat. no.
TG-Inert Silco Empty Column	3	2	1/8	–	Each	27000-7490
TG-Micropacked Column	1	1	1/16	80/100	Each	27001-6300
TG-Micropacked Column	1.5	1	1/16	80/100	Each	27001-7640
TG-Micropacked Column	2	1	1/16	80/100	Each	27001-6310
TG-Packed Column	1	2	1/8	60/80	Each	27001-7430
TG-Packed Column	1.83	2	1/8	60/80	Each	1518074
TG-Packed Column	1.83	2	1/8	80/100	Each	26017900
TG-Packed Column	4	2	1/8	60/80	Each	27001-7510
TG-Packed Column	8	2	1/8	80/100	Each	1517846

### MS-13X packed columns

Description	Length (m)	Inner diameter (ID, mm)	Outer diameter (OD, inch)	Mesh	Quantity	Cat. no.
TG-Packed Column	1.2	2	1/8	45/60	Each	27002-7440
TG-Packed Column	1.5	2	1/8	80/100	Each	27002-7450
TG-Packed Column	1.83	2	1/8	45/60	Each	1518078
TG-Micropacked Column	1.2	1	1/16	80/100	Each	27002-7630

## Porous polymers

Wide range of HayeSep™ polymers for analysis of volatile compounds and light solvents

### HayeSep D packed columns

Description	Length (m)	Inner diameter (ID, mm)	Outer diameter (OD, inch)	Mesh	Quantity	Cat. no.
TG-Packed Column HayeSep D	2.0	2	1/8	80/100	Each	1518280

### HayeSep DB packed columns

Description	Length (m)	Inner diameter (ID, mm)	Outer diameter (OD, inch)	Mesh	Quantity	Cat. no.
TG-Packed Column	2	2	1/8	80/100	Each	27003-7470
TG-Packed Column Preconditioned	6	3.2	1/8	60/80	Each	27004-7530W

### HayeSep N packed columns

Description	Length (m)	Inner diameter (ID, mm)	Outer diameter (OD, inch)	Mesh	Quantity	Cat. no.
TG-Packed Column	0.5	2	1/8	80/100	Each	27005-7400
TG-Packed Column	0.5	2	1/8	80/100	Each	1518281
TG-Packed Column	1.8	2	1/8	80/100	Each	27005-7460
TG-Micropacked Column	0.5	1	1/16	80/100	Each	27005-7610

### HayeSep P packed columns

Description	Length (m)	Inner diameter (ID, mm)	Outer diameter (OD, inch)	Mesh	Quantity	Cat. no.
TG-Packed Column	1.8	2	1/8	80/100	Each	27006-7460

### HayeSep PP-Q packed columns

Description	Length (m)	Inner diameter (ID, mm)	Outer diameter (OD, inch)	Mesh	Quantity	Cat. no.
TG-Packed Column	0.5	2	1/8	80/100	Each	1518282
TG-Packed Column-kit-B	2	2	1/8	80/100	Each	1515941
TG-Packed Column-kit-C	2	2	1/8	80/100	Each	1517799
TG-Packed Column-kit-D	2	2	1/8	80/100	Each	1515805
TG-Packed Column	4	2	1/8	80/100	Each	1517800
TG-Packed Column	3	2	1/8	80/100	Each	1518610



## Porous polymers (continued)

### HayeSep PP-N packed columns

Description	Length (m)	Inner diameter (ID, mm)	Outer diameter (OD, inch)	Mesh	Quantity	Cat. no.
TG-Packed Column	1.83	2	1/8	80/100	Each	1518072
TG-Packed Column-kit-D	1.83	2	1/8	80/100	Each	26017800

### HayeSep S packed columns

Description	Length (m)	Inner diameter (ID, mm)	Outer diameter (OD, inch)	Mesh	Quantity	Cat. no.
TG-Micropacked Column	1	1	1/16	100/120	Each	27009-6300
TG-Micropacked Column	2	1	1/16	100/120	Each	27009-6310

### HayeSep T packed columns

Description	Length (m)	Inner diameter (ID, mm)	Outer diameter (OD, inch)	Mesh	Quantity	Cat. no.
TG-Packed Column	0.5	2	1/8	80/100	Each	27010-7400

### HayeSep Q packed columns

Description	Length (m)	Inner diameter (ID, mm)	Outer diameter (OD, inch)	Mesh	Quantity	Cat. no.
TG-Micropacked Column	0.25	1	1/16	80/100	Each	27007-7600
TG-Micropacked Column	1	1	1/16	100/120	Each	27007-6300
TG-Micropacked Column	1.5	1	1/16	80/100	Each	27007-7640
TG-Micropacked Column	2	1	1/16	100/120	Each	27007-6310
TG-Packed Column	0.5	2	1/8	80/100	Each	27007-7400
TG-Packed Column	0.5	2	1/8	80/100	Each	26017700
TG-Packed Column	1	2	1/8	80/100	Each	27011-7430
TG-Packed Column	3.3	2	1/8	80/100	Each	1515932

### HayeSep QS packed columns

Description	Length (m)	Inner diameter (ID, mm)	Outer diameter (OD, inch)	Mesh	Quantity	Cat. no.
TG-Packed Column	2	2	1/8	80/100	Each	27011-7470

## ShinCarbon™ columns

High surface area carbon molecular sieve for analysis of highly volatile compounds and gases such as oxygen, nitrogen, methane, carbon monoxide, and carbon dioxide at room temperature

### ShinCarbon ST packed columns

Description	Length (m)	Inner diameter (ID, mm)	Outer diameter (OD, inch)	Mesh	Quantity	Cat. no.
TG-Micropacked Column	1	1	1/16	100/120	Each	27012-6300P
TG-Micropacked Column	2	1	1/16	100/120	Each	27012-6310P

## Application-specific columns

### Application-specific columns

Description	Length (m)	Inner diameter (ID, mm)	Outer diameter (OD, inch)	Mesh	Quantity	Cat. no.
TG-Micropacked Column 20% TCEP on Chromosorb P A/W	0.56	0.75	1/16	100/120	Each	1515991
TG-Packed 2 column set, D3606 application	-	2	1/8	-	Each	1515993

## Silica-packed columns

### Silica-packed columns

Description	Length (m)	Inner diameter (ID, mm)	Outer diameter (OD, inch)	Mesh	Quantity	Cat. no.
<b>TG-Packed Column</b> 10%SE-30 DIATO-WAW	0.75	2	1/8	80/100	Each	<b>27014-7420</b>
<b>TG-Packed Column</b> 30%DC-200/500 CHR-PAW	0.4	2	1/8	80/100	Each	<b>1517538</b>
<b>TG-Packed Column</b> 30%DC-200/500 CHR-PAW	0.5	2	1/8	60/80	Each	<b>1518005</b>
<b>TG-Packed Column</b> 30%DC-200/500 CHR-PAW	0.6	2	1/8	60/80	Each	<b>27018-7410</b>
<b>TG-Packed Column</b> 1.5%OV-101 CHR-GHP	0.6	2	1/8	100/120	Each	<b>27017-7410</b>
<b>TG-Packed Column</b> 30%DC-200/500 CHR-PAW	0.66	2	1/8	60/80	Each	<b>1518077</b>
<b>TG-Packed Column</b> 1.0% OV-101 CHR-GAW	0.66	2	1/8	100/120	Each	<b>1518080</b>
<b>TG-Packed Column</b> 20%TCEP CHR-PAW	4.5	2	1/8	80/100	Each	<b>27015-7520</b>
<b>TG-Packed Column</b> 30%DC-200/500 CHR-PAW	7.3	2	1/8	80/100	Each	<b>1517539</b>
<b>TG-Packed Column</b> 30%DC-200/500 CHR-PAW	9.0	2	1/8	60/80	Each	<b>1518006</b>
<b>TG-Packed Column</b> 30%DC-200/500 CHR-PAW	10.6	2	1/8	60/80	Each	<b>27018-7540</b>
<b>TG-Packed Column</b> 30%DC-200/500 CHR-PAW	10,7	2	1/8	60/80	Each	<b>1518079</b>
<b>TG-Micropacked Column</b> 20%TCEP CHR-PAW	0.56	1	1/16	80/100	Each	<b>27016-7620</b>

# Guard columns

## Thermo Scientific™ GuardGOLD™ Capillary Columns

## Thermo Scientific™ HydroGOLD™ Capillary 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
- The Hydrogold capillary column extends column lifetime by preventing degradation from harsh “steam-cleaning” water injections

### Thermo Scientific GuardGOLD and HydroGOLD capillary columns

ID (mm)	Length (m)	Quantity	Cat. no. GuardGOLD	Quantity	Cat. no. HydroGOLD
0.25	2	Each	<a href="#">26050-0225</a>	—	—
0.32	2	Each	<a href="#">26050-0232</a>	Each	26H50-0232
0.53	2	Each	<a href="#">26050-0253</a>	Each	26H50-0253
0.25	5	Each	<a href="#">26050-0525</a>	Each	26H50-0525
0.32	5	Each	<a href="#">26050-0532</a>	Each	26H50-0532
0.53	5	Each	<a href="#">26050-0553</a>	Each	26H50-0553
0.25	10	Each	<a href="#">26050-1025</a>	—	—
0.32	10	Each	<a href="#">26050-1032</a>	Each	26H50-1032
0.53	10	Each	<a href="#">26050-1053</a>	Each	26H50-1053

# Application kits

## Volatile organic compound (VOC) application kit

### Volatile organic compound (VOC) application kit

Description	Quantity	Cat. no.
Volatile organic compound(VOC) application kit	Each	60181-734
<b>Contains the following</b>		
TraceGOLD TG-VMS GC columns (20 m x 0.18 mm x 1.00 µm)	Each	<a href="#">26080-4950</a>
BTO septa 11 mm diameter (blister pack)	50/pack	<a href="#">31303233-BP</a>
LinerGOLD split liner (1 x 6.3 x 78.5 mm)	5/pack	<a href="#">453A1335-UI</a>
LinerGOLD splitless liner, single taper, wool (4 x 6.5 x 78.5 mm)	5/pack	<a href="#">453A1925-UI</a>
Gold plated inlet seals, 0.8 mm	2/pack	<a href="#">290GA082</a>
Liner sealing ring for SSL	5/pack	MI-290AA1-0001
Column nut for SSL and SSL Backflush	5/pack	<a href="#">35050458</a>
Ferrules for 0.1-0.25 mm ID column	10/pack	<a href="#">290VA191</a>
SureStop 2 mL screw silanized amber glass vial, Level 2	100 pack	<a href="#">6ASV9-S2P</a>
SureSTART 9 mm screw caps	100 pack	<a href="#">6ASC9ST1</a>
Thermo Scientific™ SureSTART™ EPA certified screw vial and cap kits	100 pack	<a href="#">6AK40AOTAS</a>

## Semi-volatile organic compound (SVOC) application kit

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

Description	Quantity	Cat. no.
Semi-volatile organic compounds (SVOC) application kit	Each	60181-736
<b>Contains the following:</b>		
TraceGOLD TG-5MS GC columns (30 m x 0.25 mm x 0.50 mm)	Each	<a href="#">26098-2230</a>
BTO septa 11 mm diameter (blister pack)	50/pack	<a href="#">31303233-BP</a>
LinerGOLD precisiom liner, wool (4 x 6.3 x 78.5 mm)	5/pack	<a href="#">453A1255-UI</a>
LinerGOLD splitless liner, single taper, wool (4 x 6.5 x 78.5 mm)	5/pack	<a href="#">453A1925-UI</a>
Gold plated inlet seals, 0.8 mm	2/pack	<a href="#">290GA082</a>
Liner sealing ring for SSL	5/pack	<a href="#">29001320</a>
Column nut for SSL and SSL Backflush	5/pack	<a href="#">35050458</a>
Ferrules for 0.1-0.25 mm ID column	10/pack	<a href="#">290VA191</a>
Thermo Scientific™ SureStop™ 2 mL screw silanized amber glass vial, level 2	100 pack	<a href="#">6ASV9-S2P</a>
Thermo Scientific™ SureSTART™ 9 mm screw caps	100 pack	<a href="#">6ASC9ST1</a>
Fixed-needle syringes for GC instruments	Each	<a href="#">36520060</a>

## Persistent organic pollutants (POPs) confirmation kit

### Persistent organic pollutants (POPs) confirmation kit

Description	Quantity	Cat. no.
Persistent organic pollutants (POPs) confirmation kit	Each	TS-MKITG503
<b>Contains the following:</b>		
TraceGOLD TG-Dioxin GC columns (60 m x 0.25 mm x 0.25 µm)	Each	<a href="#">26066-1540</a>
BTO septa 11 mm diameter (blister pack)	50/pack	<a href="#">31303233-BP</a>
LinerGOLD precision liner, wool, (4 x 6.3 x 78.5 mm)	5/pack	<a href="#">453A1255-UI</a>
LinerGOLD splitless liner, single taper, wool (4 x 6.5 x 78.5 mm)	5/pack	<a href="#">453A1925-UI</a>
Gold plated inlet seals for Agilent GC's, 0.8 mm	2/pack	<a href="#">290GA082</a>
Liner sealing ring for SSL	5/pack	<a href="#">29001320</a>
Column nut for SSL and SSL Backflush	5/pack	<a href="#">35050458</a>
Ferrules for 0.1-0.25 mm ID column	10/pack	<a href="#">290VA191</a>
Thermo Scientific™ GC SMART syringes	Each	<a href="#">365D0271-SM</a>
Thermo Scientific™ SureSTART™ 1.7 mL high recovery glass screw top microvials	100 pack	<a href="#">6PSV9-v1</a>
SureSTART 9 mm screw caps	100 pack	<a href="#">6ASC9ST1</a>



# GC reagents

## Make the undetectable detectable

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

- Silylation reagents
- Acylation reagents
- Alkylation reagents
- Siliconizing fluids

Learn more at

[thermofisher.com/gcreagents](http://thermofisher.com/gcreagents)

## 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



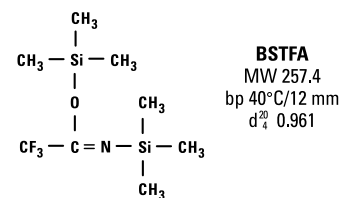


# Silylation reagents

## BSTFA and BSTFA + TMCS reagent

For excellent chromatographic separations and difficult-to-silylate compounds

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



### BSTFA and BSTFA + TMCS reagent

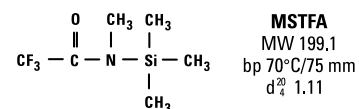
Description	Quantity		Quantity	Cat. no.
BSTFA	10 × 1 mL ampules		Each	<a href="#">TS-38830</a>
	25 g		Each	<a href="#">TS-38828</a>
	100 g	X	Each	<a href="#">TS-38829</a>
BSTFA + 1% TMCS	10 × 1 mL ampules		Each	<a href="#">TS-38831</a>
	10g		Each	<a href="#">TS-38832</a>
	25 g		Each	<a href="#">TS-38833</a>
	100 g	X	Each	<a href="#">TS-38834</a>
BSTFA + 10% TMCS	10 × 1 mL ampules		Each	<a href="#">TS-38840</a>

X indicates that hazardous shipping charges apply

## MSTFA and MSTFA + 1% TMCS reagent

Offers maximum volatility

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



### MSTFA and MSTFA + 1% TMCS reagent

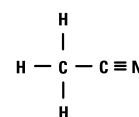
Description	Quantity		Quantity	Cat. no.
MSTFA	10 × 1 mL ampules		Each	<a href="#">TS-48910</a>
	10 g		Each	<a href="#">TS-48911</a>
	25 mL		Each	<a href="#">TS-48913</a>
	100 mL	X	Each	<a href="#">TS-48914</a>
MSTFA + 1% TMCS	10 × 1 mL ampules		Each	<a href="#">TS-48915</a>

X indicates that hazardous shipping charges apply

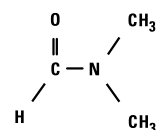
## Silylation grade solvents

### Manufactured to meet your exact silylation needs

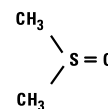
- Purified, dried and packaged under nitrogen in convenient 50 mL Hypo-Vial Sample Storage Vials
- Supplied with elastomer septa, allowing immediate access to the sample without exposure to moisture and oxygen
- Use polar solvents (acetonitrile, dimethylformamide, dimethylsulfoxide, pyridine, tetrahydrofuran)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



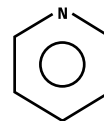
**Acetonitrile**  
MW 41.05  
bp 81.6°C



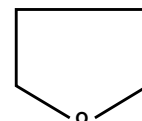
**Dimethylformamide**  
MW 73.09  
bp 153°C



**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

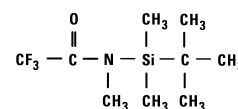
Description	Quantity		Quantity	Cat. no.
Acetonitrile	50 mL	X	Each	<a href="#">TS-20062</a>
Dimethylformamide (DMF)	50 mL	X	Each	<a href="#">TS-20672</a>
Dimethylsulfoxide (DMSO)	50 mL	X	Each	<a href="#">TS-20684</a>
Pyridine	50 mL	X	Each	<a href="#">TS-27530</a>

X indicates that hazardous shipping charges apply

## MTBSTFA and MTBSTFA + 1% TBDMCS reagent

### 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<sub>4</sub><sup>20</sup> 1.121

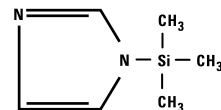
### MTBSTFA and MTBSTFA + 1% TBDMCS reagent

Description	Quantity	Quantity	Cat. no.
MTBSTFA	5 mL ampules	Each	<a href="#">TS-48920</a>
MTBSTFA + 1% TBDMCS	10 × 1 mL	Each	<a href="#">TS-48927</a>
MTBSTFA	1000 mL	Each	<a href="#">TS-48929</a>

## TMSI (N-Trimethylsilylimidazole) reagent

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<sub>4</sub><sup>20</sup> 0.957

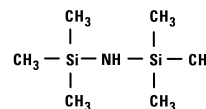
### TMSI reagent

Description	Quantity	Cat. no.	Quantity
TMSI	10 × 1 mL ampules	<a href="#">TS-88623</a>	Each
(N-Trimethylsilylimidazole)	25 g	<a href="#">TS-88625</a>	Each

## HMDS (Hexamethyldisilazane) reagent

The popular choice for silylation of sugars and related substances

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



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

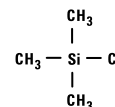
### HMDS reagent

Description	Quantity	Quantity	Cat. no.
HMDS (Hexamethyldisilazane)	25 g	Each	<a href="#">TS-84770</a>

## TMCS (Trimethylchlorosilane) reagent

An excellent catalyst for difficult-to-silylate compounds

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



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

### TMCS reagent

Description	Quantity	Quantity	Cat. no.
TMCS	25 g	Each	<a href="#">TS-88530</a>

## 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	Quantity	Cat. no.
MOX (Methoxamine) reagent (2% methoxyamine HCl in pyridine)	10 mL	Each	<a href="#">TS-45950</a>

## 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	Quantity	Cat. no.
Tri-Sil HTP reagent HMDS:TMCS:Pyridine (2:1:10)	10 × 1 mL ampules	Each	<a href="#">TS-48999</a>
Tri-Sil HTP reagent HMDS:TMCS:Pyridine (2:1:10)	50 mL	X Each	<a href="#">TS-49001</a>

X indicates that hazardous shipping charges apply

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

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

Tri-Sil BP reagent reacts with:

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

### Tri-Sil BP reagent

Description	Quantity	Quantity	Cat. no.
Tri-Sil BP reagent (2.5mEq/ mL BSA in pyridine)	25 mL	Each	<a href="#">TS-49012</a>

## 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 °C to 80 °C, although very hindered hydroxyls may require several hours

### Tri-Sil TBT reagent

Description	Quantity	Quantity	Cat. no.
Tri-Sil TBT reagent TMSI:BSA:TMCS (3:3:2)	10 × 1 mL ampules	Each	<a href="#">TS-49016</a>

## 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

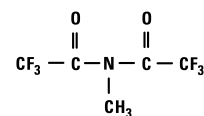
Description	Quantity	Quantity	Cat. no.
Tri-Sil TP reagent TMSI: Pyridine (1:4)	10 × 1 mL ampules	Each	<a href="#">TS-49230</a>
Tri-Sil TP reagent TMSI: Pyridine (1:4)	25 mL	Each	<a href="#">TS-49231</a>

# Acylation reagents

## MBTFA reagent

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

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

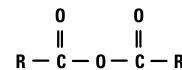


**MBTFA**  
MW 223.08  
bp 123-124°C  
d<sub>4</sub><sup>20</sup> 1.55

### MBTFA reagent

Description	Quantity	Quantity	Cat. no.
MBTFA [N-Methyl-bis(trifluoroacetamide)]	10 × 1 mL ampules	Each	<a href="#">TS-49700</a>

## Perfluoro acid anhydrides (TFAA, PFAA and HFAA) reagent



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 reagent

Description	Quantity		Quantity	Cat. no.
TFAA (Trifluoroacetic Acid Anhydride)	100 g	X	Each	<a href="#">TS-67363</a>
PFAA (Pentafluoropropionic Acid Anhydride)	10 × 1 mL ampules		Each	<a href="#">TS-65193</a>
PFAA	100 g	X	Each	<a href="#">TS-65191</a>
HFAA (Heptafluorobutyric Acid Anhydride)	10 × 1 mL ampules		Each	<a href="#">TS-63164</a>
HFAA	25 g	X	Each	<a href="#">TS-63163</a>

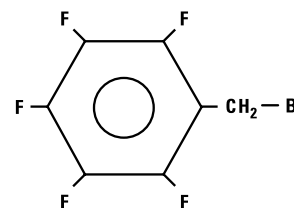
X indicates that hazardous shipping charges apply

# Alkylation reagents

## Pentafluorobenzyl bromide (PFBBr) reagent

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

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



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

### Pentafluorobenzyl bromide (PFBBr) reagent

Description	Quantity	Quantity	Cat. no.
PFBBr (Pentafluorobenzyl Bromide)	5 g	Each	<a href="#">TS-58220</a>

## MethElute (TMPAH) reagent

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	Quantity	Cat. no.
MethElute reagent (TMPAH)	10 mL	Each	<a href="#">TS-49300</a>
MethElute reagent (TMPAH)	12 × 1 mL ampules	Each	<a href="#">TS-49301</a>



# Siliconizing fluids

## Water-soluble siliconizing fluid

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

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

### Water-soluble siliconizing fluid

Description	Quantity		Quantity	Cat. no.
Siliconizing Fluid-Water Soluble	120 mL	X	Each	<a href="#">TS-42799</a>

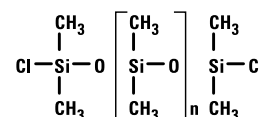
X indicates that hazardous shipping charges apply

## Hydrocarbon-soluble siliconizing fluid

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

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

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



**Siliconizing Fluid – Hydrocarbon Soluble**

### Hydrocarbon-soluble siliconizing fluid

Description	Quantity		Quantity	Cat. no.
Siliconizing Fluid-Hydrocarbon Soluble	120 mL	X	Each	<a href="#">TS-42800</a>
Siliconizing Fluid-Hydrocarbon Soluble	480 mL	X	Each	<a href="#">TS-42801</a>

X indicates that hazardous shipping charges apply

# Reacti-Therm heating, stirring, and evaporation modules

## Thermo Scientific™ Reacti-Therm™ Heating 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



### Thermo Scientific Reacti-Therm heating modules

Type	Size of unit	Quantity	Cat. no.
Heating function	Single-block	Each	<a href="#">TS-18822</a>
	Triple-block	Each	<a href="#">TS-18824</a>
Remote temperature probe		Each	<a href="#">TS-18820</a>

### Reacti-Therm heating and stirring modules

Type	Size of unit	Quantity	Cat. no.
Heating and stirring function	Single block	Each	<a href="#">TS-18821</a>
	Triple-block	Each	<a href="#">TS-18823</a>
Magnetic stirrers for 3.0, 5.0, 10.0 mL Thermo Scientific™ Reacti-Vial™		6/pack	<a href="#">TS-16000</a>
Magnetic stirrers for 0.3 and 1 mL small reaction vials		6/pack	<a href="#">TS-16010</a>

### 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-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

### Thermo Scientific Reacti-Vap evaporators

No. of ports	For use with	Quantity	Cat. no.
9	Single-block Reacti-Therm module*	Each	<a href="#">TS-18825</a>
27	Triple-block Reacti-Therm module**	Each	<a href="#">TS-18826</a>

\* includes 9 stainless-steel needles (6.4 cm/2.5") with Luer-Lok Hubs

\*\* includes 27 stainless-steel needles (6.4 cm/2.5") with Luer-Lok Hubs

### 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-Block™ Aluminium Blocks

## Optimal thermal conductivity

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



## Thermo Scientific Reacti-Block aluminium blocks

Description		Cat. no
<b>Reacti-Block A-1</b> Holds 13 x 0.3 mL or 1 mL Reacti-Vials; 13 holes/14 mm dia. × 23 mm deep		<a href="#">TS-18801</a>
<b>Reacti-Block B-1</b> Holds 9 x 3 mL or 5 mL Reacti-Vials; 9 holes/21 mm dia. × 32 mm deep		<a href="#">TS-18802</a>
<b>Reacti-Block C-1</b> Holds 13 x 3.5 mL screw cap septum vials; 13 holes/15 mm dia. × 34 mm deep		<a href="#">TS-18803</a>
<b>Reacti-Block Z-1</b> Holds 9 x 0.1 mL Reacti-Vials; 9 holes/12 mm dia. × 21 mm deep		<a href="#">TS-18804</a>
<b>Reacti-Block M-1</b> Holds 6 x 27.5 mL Reacti-Vials; 6 holes/28.5 mm dia. × 70 mm deep		<a href="#">TS-18811</a>
<b>Reacti-Block Q-1</b> Holds 8 x 10mL Reacti-Vials; 8 Holes (25 mm diameter x 46mm deep)		<a href="#">TS-18814</a>
<b>Reacti-Block S-1</b> Holds 13 x 13 mm dia. Test tubes; 13 holes/14 mm dia. × 45 mm deep		<a href="#">TS-18816</a>
<b>Reacti-Block T-1</b> Holds 9 x 16 mm dia. Test tubes; 9 holes/17 mm dia. × 45 mm deep		<a href="#">TS-18817</a>
<b>Reacti-Block U-1</b> Holds 8 x 20 mm dia. Test tubes; 8 holes/21 mm dia. × 45 mm deep		<a href="#">TS-18818</a>
<b>Reacti-Block V-1</b> Holds 17 Microcentrifuge Test tubes; 17 holes/11 mm dia. × 45 mm deep		<a href="#">TS-18819</a>

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

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

## Thermo Scientific™ 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: 225 mm length x 8 mm diameter
- Compatible for use in Reacti-Therm heating modules and other laboratory equipment



### Thermo Scientific Reacti-Therm thermometers

Min. temperature (°C)	Max. temperature (°C)	Quantity	Cat. no.
0	100	Each	<a href="#">TS-18914</a>
0	200	Each	<a href="#">TS-18915</a>

## Thermo Scientific™ Reacti-Vap™ Evaporator Replacement Parts

### Thermo Scientific Reacti-Vap evaporator replacement parts

Description	Quantity	Cat. no.
Reacti-Vap replacement tube kit 2.5 inch (64 mm) (tubes and plugs)	9/pack	<a href="#">TS-18782</a>
Reacti-Vap PTFE-Coated needles 102 mm (4in) length	9/pack	<a href="#">TS-18784</a>
Reacti-Vap PTFE-Coated needles 152 mm (6in) length	9/pack	<a href="#">TS-18786</a>
Replacement Luer-Lok fitting	Each	<a href="#">TS-18827</a>
Replacement height adjustment knob	Each	<a href="#">TS-18829</a>
Replacement metal rod	Each	<a href="#">TS-18831</a>



## Thermo Scientific™ 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



### Thermo Scientific vacuum hydrolysis tubes

Volume ( mL )	OD (mm)	Length (mm)	Quantity	Cat. no.
1	8	60	Each	<a href="#">TS-29570</a>
6	10	150	Each	<a href="#">TS-29571</a>
18	19	100	Each	<a href="#">TS-29572</a>

## Thermo Scientific™ Reacti-Vial™ Small Reaction Vials

An internal cone makes small sample handling easy and convenient

- Extra thick glass wall magnifies the sample, making these vials ideal for observing chemical reactions
- Amber vials available for light-sensitive compounds
- Supplied complete with Open-top screw caps and PTFE/rubber discs



### Thermo Scientific Reacti-Vial small reaction vials

Capacity	Quantity	Cat. no.
<b>Amber</b>		
1 mL	12/pack	<a href="#">TS-13097</a>
5 mL	12/pack	<a href="#">TS-13099</a>
<b>Clear</b>		
100 µL	12/pack	<a href="#">TS-13100</a>
300 µL	12/pack	<a href="#">TS-13220</a>
1 mL	12/pack	<a href="#">TS-13221</a>
3 mL	12/pack	<a href="#">TS-13222</a>
5 mL	12/pack	<a href="#">TS-13223</a>
10 mL	12/pack	<a href="#">TS-13225</a>

### 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	Quantity	Cat. no.
8	100 µL Reacti-Vial small reaction vials, 1.5 mL screw cap septum vials	72/pack	<a href="#">TS-12708</a>
12	0.3 mL, 1 mL Reacti-Vial small reaction vials, 3.5 mL screw cap septum vials	72/pack	<a href="#">TS-12712</a>
13	7 mL screw cap septum vials	72/pack	<a href="#">TS-12713</a>
16	14 mL screw cap septum vials, 15 mL (0.5 oz.) screw cap bottles	72/pack	<a href="#">TS-12716</a>
18	3 and 5 mL Reacti-Vial small reaction vials	72/pack	<a href="#">TS-12718</a>
22	25 mL, 40 mL screw cap septum vials, 240 mL (8 oz.) screw cap bottles, 10 mL Reacti-Vial	72/pack	<a href="#">TS-12722</a>

## Thermo Scientific™ PTFE/Rubber Laminated Discs

Provides a highly inert and unreactive seal

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



### Thermo Scientific PTFE/rubber laminated discs

Diameter (mm)	Fits	Quantity	Cat. no.
12	0.3 and 1 mL Reacti-Vial small reaction vials, 2 mL and 3.5 mL screw cap septum vial	72/pack	<a href="#">TS-12412</a>
18	3 and 5 mL Reacti-Vial small reaction vials, 10 mL and 25 mL Reacti-Flask	72/pack	<a href="#">TS-12418</a>

## Thermo Scientific™ 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



### Thermo Scientific open-top screw caps

Fits	Quantity	Cat. no.
3 mL, 5 mL Reacti-Vials	72/pack	<a href="#">TS-13218</a>
0.3 mL, 1.0 mL Reacti-Vials, 3.5 mL screw cap septum vial	72/pack	<a href="#">TS-13215</a>
10 mL Reacti-Vials, 40 mL screw cap septum vials	72/pack	<a href="#">TS-13219</a>

## Thermo Scientific™ 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



### Thermo Scientific screw cap septum vials

Description	Quantity	Cat. no.
Clear color; 3.5 mL capacity	72/pack	<a href="#">TS-13019</a>
Clear color; 7.0 mL capacity	72/pack	<a href="#">TS-13028</a>

Ordering alert: Septa not included with vials; must be ordered separately

## Thermo Scientific™ 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 – 20 mm (thread size 20/400) and 27 mm (thread size 24/400) to fit 3 mL and 5 mL Reacti-Vial small reaction vials and 40 mL 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



### Thermo Scientific mininert valves

Size (mm)	Fits	Quantity	Cat. no.
20	Fits 3 mL and 5 mL Reacti-Vial small reaction vials	12/pack	<a href="#">TS-10135</a>
27	Fits 40 mL screw cap septum vials	12/pack	<a href="#">TS-10130</a>



Learn more at [thermofisher.com/chromatographyconsumables](http://thermofisher.com/chromatographyconsumables)

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