ThermoFisher SCIENTIFIC



GC columns and accessories

Connected chromatography solutions

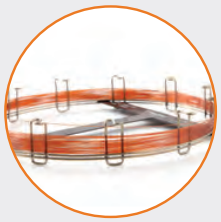
GC columns and accessories

thermo scientific

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.

Section contents

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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



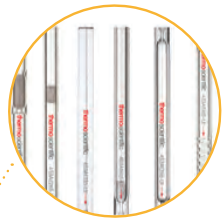
Gas filters



Septa



Ferrules/nuts



Liners



Columns connectors



GC columns



Thermo Scientific™ GLD Pro Gas Leak Detector



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	• Typically open-ended • Large surface area and volume • Design to aid mixing • Low activity
Splitless 	Sample focused onto column – minimizes sample contact with reactive metal components	• Typically tapered • Small volume to aid transfer • Low activity
PTV	Rapid heating and cooling, fast transfer to column-used for active compounds such as pesticides and Large volume injections	• Small, to aid sample transfer • Good thermal properties for rapid heating and cooling • SilTek™ coating provides highly inert surface

GC ferrules

Material	Uses	Advantages	Limitations
100% graphite	Injector and GC detectors, high temperature	• Easy-to-use stable seal • Higher temperature limit • Can be easily removed • Can be re-used	• Not for mass spectrometer (MS) or oxygen-sensitive detectors • Soft, easily deformed or destroyed • Possible system contamination
Vespel/ graphite	Injector, MS and oxygen-sensitive detectors	• Long lifetime • High temperature limit • MS compatible	• Cannot be re-used • Must be re-tightened after initial temperature cycles
Thermo Scientific™ SilTite™ Ferrules	Injector, MS and oxygen-sensitive detectors	• Long lifetime • High temperature limit • MS compatible	• Cannot be re-used

GC columns

Column parameter	Parameters affecting resolution			Performance changes
	Efficiency	Retention	Selectivity	
Column length (m)	✔			Doubling column length increases resolution by ~ 40%
Internal diameter (mm)	✔	✔		The smaller the column ID, the greater the efficiency and better the resolution
Film thickness (µm)		✔	✔	The thicker the film, the greater the retention (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	• Increase lifetime of column and liner • Higher sensitivity and data accuracy • Less maintenance
GC-FID	Carrier	1× triple-moisture/oxygen/hydrocarbons	3 (Option A) 4 (Option B)	
	Detector	Option A: 2× hydrocarbon or 2× combi-hydrocarbon/moisture Option B: 3× hydrocarbon or 3× combi-hydrocarbon/moisture		
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_2, N_2, AR, Air	–	21 g H_2O	–	7.2 g H_2O
Oxygen filter	Inert carrier, He, H_2, N_2, AR	–	450 mL O_2	–	150 mL O_2
Hydrocarbon filter	Inert carrier, He, H_2, N_2, AR, Air	–	36 g (as n-butane)	–	12 g (as n-butane)
Combi filter – moisture, oxygen	Inert carrier, He, H_2, N_2, AR	–	10 g H_2O, 225 mL O_2	–	–
Combi filter – moisture, hydrocarbons	Inert carrier, He, H_2, N_2, AR, Air	–	10 g H_2O, 18 g HCs (as n-butane)	–	3.5 g H_2O, 6 g HCs (as n-butane)
Triple filter – moisture, oxygen, hydrocarbons	Inert carrier, He, H_2, N_2, AR	–	6 g H_2O, 150 mL O_2, 12 g HCs (as n-butane)	35 g H_2O, 1000 mL O_2, 60 g HCs (as n-butane)	1.8 g H_2O, 75 mL O_2, 4 g HCs (as n-butane)
Triple filter – moisture, oxygen, hydrocarbons – He preconditioned for GC/MS	He	–	6 g H_2O, 150 mL O_2, 12 g HCs (as n-butane)	–	1.8 g H_2O, 75 mL O_2, 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_2O, 100 mL O_2, 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	60180-801
Oxygen filter	Each	60180-802
Hydrocarbon filter	Each	60180-803
Combi filter – moisture, oxygen	Each	60180-804
Combi filter – moisture, hydrocarbons	Each	60180-843
Triple filter – moisture, oxygen, hydrocarbons	Each	60180-805
Triple filter – moisture, oxygen, hydrocarbons – He preconditioned for GC/MS	Each	60180-806
Indicating triple filter – moisture, oxygen, hydrocarbons – He preconditioned for GC/MS	Each	60180-808
Big triple filter – moisture, oxygen, hydrocarbons	Each	60180-895
Big triple filter – moisture, oxygen, hydrocarbons – N_2 preconditioned	Each	60180-895N
Big triple filter kit – moisture, oxygen, hydrocarbons (including steel end fitting, 0.25 in.)	Each	60180-895-S4

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	60180-809
Steel end fitting, 0.125 in.	2/pack	60180-810
Brass end fitting, 0.25 in.	2/pack	60180-811
Steel end fitting, 0.25 in.	2/pack	60180-812
Double ended connector to connect filter to indicator	Each	60180-813
Replacement O-rings	Each	60180-833
Wall mounting clamp	4/pack	60180-834

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	60180-819
	Oxygen	No	Each	60180-820
	Hydrocarbons	No	Each	60180-821
Indicating combi filter	Moisture, hydrocarbons	No	Each	60180-826
Indicating triple filter	Moisture, oxygen, hydrocarbons	No	Each	60180-824
		Yes	Each	60180-830
	Moisture, oxygen, hydrocarbons, He preconditioned for GC-MS	No	Each	60180-825
		Yes	Each	60180-829
3 cartridge filter pack	1 x triple filter and 2 x combi filter (moisture, hydrocarbons)	No	Each	60180-822
		Yes	Each	60180-828
4 cartridge filter pack	1 x moisture filter, 1 x O_2 filter, 2 x hydrocarbon filter	Yes	Each	60180-827

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	1× triple filter for carrier	GC-MS, GC-TCD
Dual base	1× triple filter for carrier, 1× combi filter for detector	GC-ECD
Triple base	1× triple and 2× combi filter	GC-FPD, GC-FID, GC-NPD
Four-position base	1× triple, 3× hydrocarbon	GC-FID

Super Clean gas cartridge filter baseplates

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

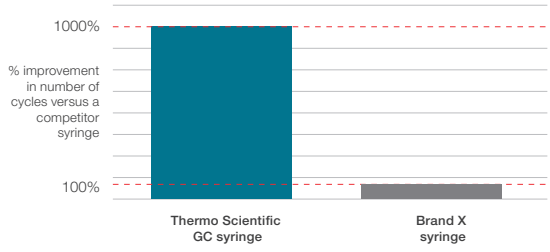
Syringes for GC

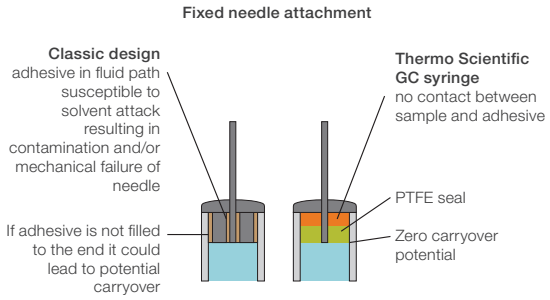
Providing durability, clarity and accuracy for your sample

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/smartchromatographysyringe
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	365A0241-SM
1	57	23	Cone	No	Microvolume injections of highly concentrated samples or Fast GC applications with narrow bore columns	365B0251-SM
5	57	23s	Cone	No	PTV all injection modes, or SSL all injection modes, or injector with Merlin adaptor	365C0231-SM
5	57	26s	Cone	No	PTV all injection modes, or SSL all injection modes	365C0251-SM
10	57	23s	Cone	No	PTV all injection modes, or SSL all injection modes, or injector with Merlin adaptor	365D0271-SM
10	57	26s	Cone	No	PTV all injection modes, or SSL all injection modes	365D0291-SM
10	57	26s	Bevel	No	PTV injection with empty straight liner (requires PTV liner cap PN 29004014), suggested for polar solvents	365D0391-SM
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	365D0311-SM
10	57	26s	Cone	Yes	PTV all injection modes, or SSL all injection modes. Particularly suitable for volatile solvents or corrosive samples	365D0331-SM
25	57	23s	Cone	Yes	PTV all injection modes, or SSL all injection modes, or injector with Merlin adaptor	365F2441-SM
25	57	26s	Cone	Yes	PTV all injection modes, or SSL all injection modes	365F2461-SM
50	57	23s	Cone	Yes	Large volume splitless with SSL, or PTV, or injector with Merlin adaptor	365G2311-SM
50	57	26s	Cone	Yes	Large volume splitless with SSL or PTV	365G2331-SM
100	57	23s	Cone	Yes	Large volume splitless with SSL, or PTV, or injector with Merlin adaptor	365H2141-SM
100	57	26s	Cone	Yes	Large volume splitless with SSL or PTV	365H2161-SM
100	57	23	Side hole	Yes	Large volume PTV with and without Merlin adaptor	365H2181-SM

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



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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	365C0221-SM
5	85	26s	Cone	No	On-column injection, SSL on Trace Ultra, or TSI	365C0241-SM
10	85	23s	Cone	No	SSL on Trace Ultra, TSI, or injector with Merlin adaptor	365D0261-SM
10	85	26s	Cone	No	On-column injection, SSL on Trace Ultra, or TSI	365D0281-SM
10	85	23s	Cone	Yes	SSL on Trace Ultra, TSI, or injector with Merlin adaptor. Particularly suitable for volatile solvents or corrosive samples	365D0301-SM
10	85	26s	Cone	Yes	On-column injection, SSL on Trace Ultra, or TSI. Particularly suitable for volatile solvents or corrosive samples	365D0321-SM
25	85	26s	Cone	Yes	On-column injection, SSL on Trace Ultra, or TSI	365F2451-SM
50	85	26s	Cone	Yes	Large volume on-column injection	365G2321-SM
100	85	26s	Cone	Yes	Large volume on-column injection	365H2151-SM
100	85	23	Side hole	Yes	Large volume PTV with and without Merlin adaptor	365H2171-SM

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	365I2331-SM
250	57	23	Side hole	Yes	Large volume PTV with and without Merlin adaptor	365I2351-SM
500	57	26	Cone	Yes	Large volume splitless with SSL without Merlin adaptor, Sample preparation (i.e., dilutions, calibrations)	365J2421-SM
500	57	23	Side hole	Yes	Large volume PTV with and without Merlin adaptor	365J2441-SM
1000	57	22	LC	Yes	Sample preparation (i.e., dilution, derivatization, liquid-liquid extraction, micro-SPE)	365K2811-SM

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	365I2321-SM
250	85	23	Side hole	Yes	Variable depth large volume PTV with and without Merlin adaptor	365I2341-SM
500	85	26	Cone	Yes	Large volume on-column injection	365J2411-SM

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)	365N2721-SM

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	365K2871-SM

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	365L2321-SM

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	365M2331-SM





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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	36SA10P1-SM	36SA10P3-SM
PDMS	1.5	250	Black	36SA25P1-SM	36SA25P3-SM
Polyacrylate	1.1	100	Gray	36SA10A1-SM	36SA10A3-SM
Carbon WR/PDMS	1.1	120	Light blue	36SA12B1-SM	36SA12B3-SM
DVB/PDMS	1.1	120	Violet	36SA12E1-SM	36SA12E3-SM
DVB/carbon WR/PDMS	1.1	120	Dark grey	36SA11T1-SM	36SA11T3-SM
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				36SA10M5-SM	

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	36SP01P1-SM	36SP01P3-SM
PDMS	0.6	30	Golden	36SP03P1-SM	36SP03P3-SM
PDMS	0.6	100	Red	36SP10P1-SM	36SP10P3-SM
Acrylate	0.6	85	Gray	36SP08A1-SM	36SP08A3-SM
Carbon WR/PDMS	0.6	95	Dark blue	36SP09C1-SM	36SP09C3-SM
DVB/carbon WR/PDMS	0.6	50/30	Dark grey	36SP05T1-SM	36SP05T3-SM
DVB/PDMS	0.6	65	Violet	36SP06E1-SM	36SP06E3-SM
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				36SP08M5-SM	

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



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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	**365B0251***

* 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	**365C0241**
	57	26s	Cone	SSL and PTV	Each	**365C0251***
10	85	23s	Cone	Merlin valve SSL injector: splitless	Each	**365D0261**
	57	23s	Cone	SSL, PTV and Merlin adapter	Each	**365D0271***
	85	26s	Cone	Splitless and OC	Each	**365D0281**
	57	26s	Cone	SSL and PTV	Each	**365D0291***

* 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	**365D0331***
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	**365H2161***
	85	23	Side hole	Variable depth LV PTV (with or without Merlin valve)	Each	**365H2171**
	57	23	Side hole	Large volume injection, PTV	Each	**365H2181***
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	**365I2351**
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	**365K2811**
2500	65	23	Side hole	Headspace, up to 115 deg.	Each	**365Q2131**
	65	23	Side hole	Headspace, up to 150 deg.	Each	**365L2321**
5000	65	22	Side hole	Headspace up to 115 deg.	Each	**365Q2141**
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	36500520	2/pack	36550046
50	50	23	Cone	–	AIAS 1610	Each	365G1503	5/pack	36566485
100	50	23	Side hole	See note	AI/AS 1610, TriPlus, AS200/AS800	Each	36520050	2/pack	36550040
100	50	23	Cone	LV splitless	TriPlus, AS2000, AS200/AS800	Each	36500495	5/pack	36566485
250	50	23	Side hole	–	TriPlus, AS2000, AS200/AS800	Each	36520051	2/pack	36550040
1000	50	23	Bevel	–	AS200/AS800	Each	365K3041	5/pack	365RN235

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	365D1841	2/pack	365RN362
10	50	23	Cone	–	AS3000, AS2000, AS200/AS800	Each	365D3731	2/pack	365RN372
50	50	23	Cone	LV splitless	AS2000	Each	36503015	5/pack	36566485

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	365D3741
10	50	26	Cone	SSL/PTV	AI/AS1610	Each	365D2977
10	50	26	Cone	SSL/PTV	AI/AS1610	6/pack	365D2976
100	50	25	Bevel	—	AS200/AS800	Each	365H2321
250	50	25	Bevel	—	AS200/AS800	Each	365I2561

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	36504047
5	50	23	Cone	—	AS3000, AS2000, AI/AS 1610, AI/AS 1310	Each	365C3701
5	50	26	Cone	Split/PTV	AI/AS 1610, AI/AS 1310	Each	36500505
10	50	26	Cone	—	AS3000, AS200, AS200/AS800	Each	365D3711
10	50	26	Cone	—	AS300, AS2000, AS200/AS800	6/pack	365D1856
10	50	25	Cone	Split/PTV	TriPlus, AS3000, AI/AS 1610, AI/AS 1310	Each	36500525
10	50	23	Cone	PTV/SSL split	AI/AS 1310, TriPlus, AS3000, AI/AS 1610, AS200/AS800	Each	36520060
10	80	23	Cone	Merlin valve SSL splitless	TriPlus, AS2000	Each	36520061
10	50	23-26	Cone	OC in PTV merlin valve	TriPlus, AS2000, AI/AS 1610	Each	36500580
10	80	26	Cone	OC and splitless	TriPlus, AS2000	Each	36502019

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	36504045
0.5	80	26	Cone	Splitless and OC	TriPlus	Each	36504046

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	365D1611

Thermo Scientific fixed-needle, gas-tight syringes

Volume (µL)	Length (mm)	Gauge	Tip style	Quantity	Cat. no.
10	42	23-26	Cone	Each	365D0621
		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	365C0951
		23	Cone	6/pack	365C0956
		23-26s	Cone	Each	365C0971
		23-26s	Cone	6/pack	365C0976
10	42	23	Cone	Each	365D1571
		23	Cone	6/pack	365D1576
		23-26s	Cone	Each	365D1621
		23-26s	Cone	6/pack	365D1636

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	365D6610
		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	365D3731	2/pack	365RN372
		26	Cone	Each	365D1841	2/pack	365RN362

Thermo Scientific fixed-needle, gas-tight syringes

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

Thermo Scientific fixed-needle syringes

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

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	365D0811	5/pack	365RN215
25	50	25	Bevel	Each	365F1931	5/pack	365RN225
50	50	22s	Blunt end	Each	365GLG41	5/pack	–
500	50	25	Bevel	Each	365J2881	5/pack	365RN225
		22s	Blunt end	Each	365JLG71	5/pack	–
1000	50	23	Bevel	Each	365K3041	5/pack	365RN235
5000	50	22	Bevel	Each	365M5212	–	–
10000	50	22	Bevel	Each	365N5214	–	–

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	365D1171	5/pack	365RN215
25	50	25	Bevel	Each	365F1901	5/pack	365RN225
50	50	25	Bevel	Each	365G2091	5/pack	365RN225

Thermo Scientific fixed-needle, gas-tight syringes

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

Manual GC syringes (continued)

Thermo Scientific fixed-needle syringes

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

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

Volume (µL)	Quantity	Cat. no.	Quantity	Cat. no. needle
25	Each	365F7655	2/pack	365RNL22
50	Each	365G7656	2/pack	365RNL22
100	Each	365H7657	2/pack	365RNL22
250	Each	365I7658	2/pack	365RNL22
500	Each	365J7659	2/pack	365RNL22
1000	Each	365KL531	2/pack	365RNL22

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	365H7814	2/pack	365RNL22
1000	Each	365K7817	2/pack	365RNL22
2500	Each	365L7818	2/pack	365RNL22
5000	Each	365M7819	2/pack	365RNL22
10000	Each	365N7820	2/pack	365RNL22



Injection port septa

Septa

Quality materials for all applications

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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	31303240-BP	50/pack	31303240
BTO	11*	50/pack	31303233-BP	50/pack	31303233
BTO	11.5	50/pack	31303230-BP	50/pack	31303230
BTO	12.7	48/pack	31303250-BP	50/pack	31303228
BTO	17	48/pack	31303215-BP	50/pack	31303211
TR-Green	9	50/pack	313G3240-BP	50/pack	313G3240
TR-Green	11*	50/pack	313G3230-BP	50/pack	313G3230
TR-Green	12.7	48/pack	–	50/pack	313G3228
TR-Green	17	48/pack	313G3215-BP	50/pack	313G3211
Marathon	9	50/pack	313P3240-BP	50/pack	313P3240
Marathon	11*	50/pack	313P3233-BP	50/pack	313P3233
Marathon	17	48/pack	313P3215-BP	50/pack	313P3211
TR-Blue	9	–	–	50/pack	313B3240
TR-Blue	11*	–	–	50/pack	313B3233
High temperature	Plug type**	–	–	25/pack	HT-SP
Long life	Plug type**	–	–	25/pack	LL-SP

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_2Safer™ kit is installed

Thermo Scientific Gold inlet base seals

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



Thermo Scientific SilTek inlet base seals

For use with	ID (mm)	Quantity	Cat. no.
Single column installation	0.8	10/pack	290GA091
	0.8	2/pack	290GA092
Single column installation (cross version)	0.8	10/pack	290GA094

Injection port liners

Thermo Scientific™ LinerGOLD™ GC Liners

The GOLD standard in GC liner performance

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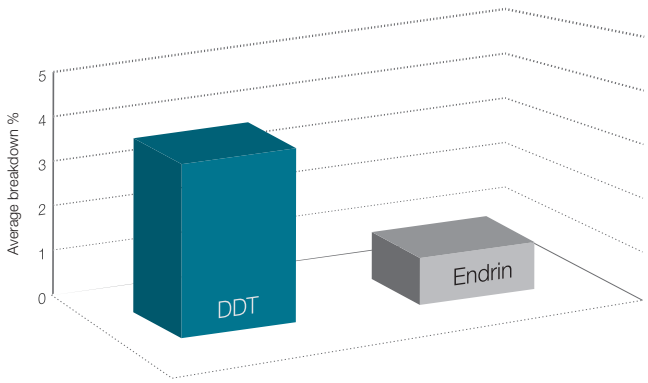


Figure 1: Endrin and DDT breakdown test results showing the lot-to-lot reproducibility and low levels of inertness of LinerGOLD GC liners

- **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.

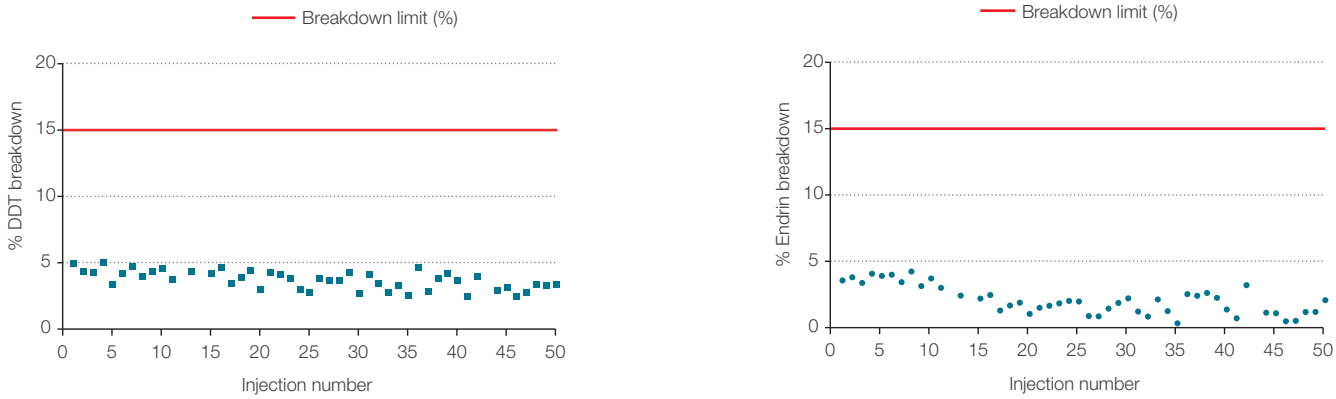


Figure 2: Compound degradation after 50 injections – LinerGOLD GC liners exhibit minimal breakdown



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 × 6.3	78.5	Quartz wool	453A2265-UI	453A1262-UI
	Split/splitless straight liner	4 × 6.3	78.5	No	453A1295-UI	453A2292-UI
	Splitless/split liner with single taper	4 × 6.5	78.5	No	453A1345-UI	453A2342-UI
	Splitless/split liner with single taper	4 × 6.5	78.5	Quartz wool	453A1925-UI	453A2922-UI
	Splitless liner with double taper	4 × 6.5	78.5	No	453A1355-UI	453A2352-UI
	Precision split/splitless liner	4 × 6.3	78.5	Quartz wool	453A1255-UI	453A1252-UI
	Direct straight liner	1 × 6.3	78.5	No	453A1335-UI	453A2332-UI
-	LinerGOLD mixed liner pack*	Mixed	78.5	Mixed	453TH002-UI	–
	LinerGOLD double taper cyclo liner	4 × 6.5	78.5	No	453A1365-UI	–
	LinerGOLD split cyclo liner	4 × 6.3	78.5	No	453A1375-UI	–
	LinerGOLD straight liner	1.7 × 6.5	78.5	No	453A0415-UI	–
	LinerGOLD straight liner	1.3 × 6.5	78.5	No	453A0411**	–

* 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	45350030-UI
	Splitless liner	3 x 8	105	No	45350032-UI
	Splitless liner	5 x 8	105	No	45350033-UI
	Precision liner	5 x 8	105	Quartz wool	453T1905-UI
	Splitless pecision liner	5 x 8	105	Quartz wool	453T2999-UI

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	453A1335	–
	Split straight liner	4 x 6.3	78.5	Quartz wool	453A2265	453A1262
	Split straight liner	4 x 6.3	78.5	No	453A1295	453A2292
	Split/splitless FocusLiner	4 x 6.3	78.5	Quartz wool	453A1255	453A1252
	Split/splitless FocusLiner with single taper	4 x 6.3	78.5	Quartz wool	453A1315	453A1312
	Split/splitless liner with single taper	4 x 6.3	78.5	No	453A1345	453A2342
	Split/splitless liner with double taper	4 x 6.3	78.5	No	453A1355	–
	Split/splitless liner w/recessed gooseneck	4 x 6.3	78.5	Quartz wool	453A1305	–
	Splitless liner with single taper	4 x 6.3	78.5	Quartz wool	453A1925	453A2295
	Split/splitless mini-lam liner	4 x 6.3	78.5	No	453A2009	–
-	Split/splitless mixed liner sample pack	Mixed	Mixed	Mixed*	453TH002	–

* 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	–	45352054	–
	PTV straight liner	2 x 2.75	120	No	–	45352057	45354057
	PTV straight liner	2 x 2.75	120	No	45322045	–	–
	PTV liner with sintered lining	1.75 x 2.75	120	No	–	45352060	–
	PTV liner with three baffles	1 x 2.75	120	No	–	45352062	–
	PTV SilTek metal liner	1 x 2.75	120	No	45322046	–	–
	PTV SilTek metal liner	2 x 2.75	120	No	45322044	–	–
	PTV SilTek metal liner	2 x 2.75	120	Quartz wool	45322056	–	–
	PTV baffle liner (siltek)	2 x 2.75	120	No	–	453T2120	–
	PTV split liner with recessed gooseneck	2 x 2.75	120	Quartz wool	–	45352070	–
	PTV silcosteel liner for OC	1 x 2.75	120	No	45322052	–	–
	PTV liner with concentric baffle	2 x 2.75	120	No	–	453T2845-UI	–
	PTV liner with five baffles	1 x 2.75	120	No	–	453T2171-UI	–

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

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	29001320
Liner sealing ring for TRACE 1300/1600 series GC PTV injector	Each	29001318
Liner sealing ring for TRACE and FOCUS GC SSL injector	10/pack	29033406
Liner sealing ring for TRACE PTV injector	2/pack	29013417
Liner sealing ring for Purge&Trap adaptor	Each	MI-290AA1-0001



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

* 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	290GA243
Viton liner sealing ring for Agilent SSL injector	10/pack	290OA241

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/smartchromatographysyringe

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

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.



SilTite metal ferrules

The Thermo Scientific™ SilTite™ Ferrule forms a strong, permanent, airtight seal around the capillary column, eliminating leaks. The base of the ferrule is flat and forms a perfect seal with the MS interface. The ferrule's temperature tolerance is well above the limit of the injector, MS interface or GC oven. Unlike other ferrules, SilTite ferrules do not need re-tightening after installation.



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	290GA139
		0.45-0.53	10/pack	290GA140
	15% graphite/85% vespel	0.1-0.25	10/pack	290VA191
		0.32	10/pack	290VA192
		0.53	10/pack	290VA193
Thermo Scientific capillary column nut for TRACE 1300/1600 series SSL injectors and non-MS detectors	Stainless steel	–	5/pack	35050458
Thermo Scientific TRACE 1300/1600 series PTV injectors	100% graphite	0.1-0.25	10/pack	29053488
		0.32	10/pack	29053487
		0.53	10/pack	29053486
Thermo Scientific capillary column nut for TRACE 1300/1600 series PTV injectors	Stainless steel	–	5/pack	35053221
Thermo Scientific™ TRACE™ Ultra injectors and non-MS detectors	100% graphite	0.1-0.25	10/pack	29053488
		0.32	10/pack	29053487
		0.53	10/pack	29053486
Thermo Scientific™ capillary column nut for TRACE Ultra	Brass		5/pack	35032423
Thermo Scientific™ MS detectors	15% graphite/85% vespel	0.1-0.25	10/pack	29033496
		0.32	10/pack	29033497
Thermo Scientific™ capillary column nut for MS detector	Brass	–	5/pack	290BT240
	Stainless steel	–	5/pack	290BT241
Thermo Scientific MS detectors	VESPEL SCP-5000	0.1-0.25	5/pack	290VT221
Thermo Scientific™ capillary column spring loaded nut for MS detectors	Stainless steel for ISQ/TSQ/ Orbitrap Exploris	–	Each	1R120434-0010
	Stainless steel for QE GC/Exactive GC	–	Each	1R120434-0020
Thermo Scientific™ SilTite™ kit for Thermo Scientific TRACE 1300/1600 series GC SSL injectors	SilTite metal	0.1-0.25	Each*	290MA215
		0.32	Each*	290MA216
		0.53	Each*	290MA217
Thermo Scientific™ SilTite™ kit for Thermo Scientific ISQ GC-MS interface	SilTite metal	0.1-0.25	Each*	290MA194
		0.32	Each*	290MA195
		0.53	Each*	290MA196
Thermo Scientific™ replacement SilTite™ ferrules for TRACE 1300/1600 series and ISQ GC-MS interface kits	SilTite metal	0.1-0.25	10/pack	290MA201
		0.32	10/pack	290MA202
		0.53	10/pack	290MA203
Thermo Scientific™ SilTite™ nuts for MS interface	–	—	5/pack	290MA205
Thermo Scientific™ SilTite™ nuts for SSL injectors	–	—	5/pack	290MA207
Thermo Scientific™ SilTite™ kits for Thermo Scientific™ DSQ GC-MS interface	SilTite metal	0.1-0.25	Each*	290MT229
		0.32	Each*	290MT230
		0.53	Each*	290MT231
		Replacement SilTite nuts	5/pack	290MT211
Thermo Scientific™ SilTite™ replacement ferrules for DSQ GC-MS interface kits	SilTite metal	0.1-0.25	10/pack	290MT221
		0.32	10/pack	290MT222
		0.53	10/pack	290MT223
Thermo Scientific TRACE 1600 series iConnect SSL injectors with HeSaver-H_2Safer	SilTite metal	< or = 0.25	10/pack	29063465
	SilTite metal	0.25	10/pack	29063466
	SilTite metal	0.32	10/pack	29063467
Thermo Scientific column nut for TRACE 1600 series iConnect SSL injectors with HeSaver-H_2Safer	–	–	2/pack	290SF303

* 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	290GA139
		0.45-0.53	10/pack	290GA140
		Packed column 1/8" OD	10/pack	290GA108
		Packed column 1/4" OD	10/pack	290GA107
	15% graphite/85% vespel	0.1-0.25	10/pack	290VA191
		0.32	10/pack	290VA192
		0.53	10/pack	290VA193
		Packed column 1/8" OD	10/pack	290VT168
		Packed column 1/4" OD	10/pack	290VT165
Capillary column nut for injectors and non-MS detectors	Stainless steel	—	5/pack	35050458
Agilent MS detectors	15% graphite/85% vespel	0.1-0.25	10/pack	29033496
		0.32	10/pack	29033497
		0.53	10/pack	290VP144
Thermo Scientific™ SilTite™ kits for Agilent SSL injectors	SilTite metal	0.1-0.25	Each*	290MA215
		0.32	Each*	290MA216
		0.53	Each*	290MA217
SilTite nuts for MS interface	—	—	5/pack	290MA205
Thermo Scientific™ SilTite™ Kit for Agilent MS detectors	SilTite metal	0.1-0.25	Each**	290MA194
		0.32	Each**	290MA195
		0.53	Each**	290MA196
Thermo Scientific™ SilTite™ Replacement Ferrules for all SilTite kits	SilTite metal	0.1-0.25	10/pack	290MA201
		0.32	10/pack	290MA202
		0.53	10/pack	290MA203
Thermo Scientific™ Nuts for SSL injectors	—	—	5/pack	290MA207

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™ µ-Union column connectors

The tiny connection for GC columns

The Thermo Scientific SilTite µ-Union is a connector for GC capillary columns, giving zero dead volume. The product has low thermal mass – it is only 9mm in length and has a mass <0.5 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



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

Each SilTite µ-Union kit contains the following:

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

SilTite µ-Union kits, ferrules, and replacement unions

Column ID (mm)	2nd column ID (mm)	Cat. no. SilTite µ-Union kit (Each)	Cat. no. SilTite µ-Union ferrules (10/pack)	Cat. no. SilTite µ-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	290MU498	290MF229	290MN211
0.32	0.32-0.53	290MU499	290MF230	290MN211
0.53	0.45-0.53	290MU500	290MF231	290MN211

* SilTite nuts must be used with SilTite ferrules

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	–	290VT186	–
0.32	290GU498	290VT187	260G498P
0.53	290GU499	290VT188	260G499P

* 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	260EC111

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	290SA131
Split/splitless and FID starter kit	Each	290SA132
Split/splitless injector base seal	Each	290SA133
Ferrules for 0.1-0.25 mm ID columns	Each	290S1132
Ferrules for 0.32 mm ID columns	Each	290S1131

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

Description	Quantity	Cat. no.
Female nut	5/pack	290ST130
Ferrules for 0.1-0.25 mm ID columns	10/pack	290S1132
Ferrules for 0.32 mm ID columns	10/pack	290S1131

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)	**For backflush analyses** Port A: 0.25 mm ID or 0.32 mm ID Port B: 0.25 mm ID or 0.32 mm ID	Each	60201-396
3 Port SilFlow Backflush MCD (0.25/0.32/0.53)	**For backflush analyses** Port A: 0.25 mm D or 0.32 mm ID Port B: 0.53 mm ID	Each	**60201-397**
3 Port SilFlow MCD (0.25/0.32)	**For splitter analyses** *(i.e. one injection to two analytical columns; one column to two detectors; allows column switching in GC-MS without the need to vent)* Port A: 0.25 mm ID or 0.32 mm ID Port B: 0.25 mm D or 0.32 mm ID	Each	60201-398
5 Port SilFlow Deans Switch MCD (0.25/0.32)	**For multidimensional analyses** Port A: 0.25 mm ID or 0.32 mm ID Port B: 0.25 mm ID or 0.32 mm ID	Each	**60201-389**

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	**29063466**
SilFlow fingertight ferrules for use with column of OD 0.45 mm	0.32 mm ID columns	10/pack	**29063467**
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	60180-835
Shortix capillary column cutter repair kit	Each	60180-836
Ceramic column cutter	Each	60201-318

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	60180-784
Capillary tool kit for Agilent GCs	Each	60180-786

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	60180-888

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	60181-632
Stainless steel*	1/8	0.085	25	Each	60181-638

* Instrument-grade, cleaned

Thermo Scientific™ GLD Pro Gas Leak Detector



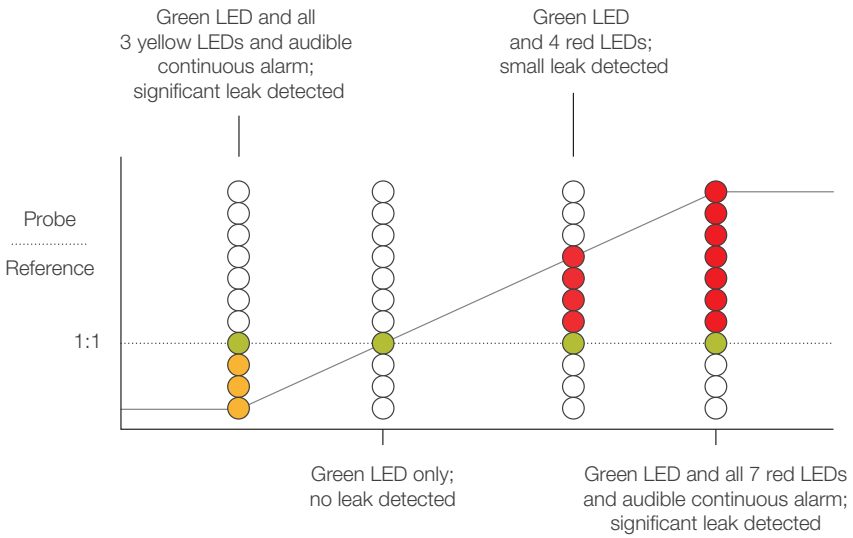
Aids in quickly locating and identifying gas leaks

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	66002-004
Small probe adaptor	Each	66002-003
Soft-Sided carry case (leak detector not included)	Each	66002-002



Thermo Scientific™ GFM Pro Flowmeter

Measure and monitor flow quickly and efficiently

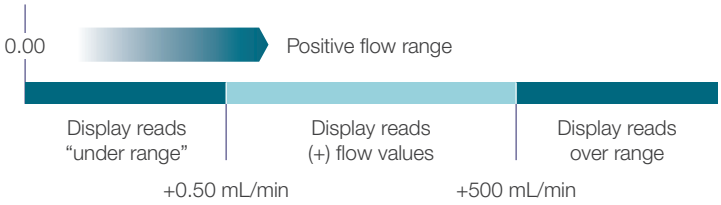


The Thermo Scientific GFM Pro flowmeter is specifically designed for use with gas chromatography instruments. This versatile product is an electronic device capable of measuring volumetric flow for all types of gases. Real-time measurements can be made for various types of flow paths including continually 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	66002-010
Soft-Sided carry case (flowmeter not included)	Each	66002-002
GFM Pro flowmeter re-calibration	Each	66002-GFMCAL



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

Application-specific GC capillary columns

Industry	Phases
Environmental and food	• TG-VVOC B; TG-VMS, TG-VRX, TR-V1; TG-624; TG-624SilMS; TG-SVOC, TR-524, TR-525, TR-8095; TR-8270; TG Mineral oil • TG-PEST; TR-Pesticide; TR-Pesticide II; TR-Pesticide III; TR-Pesticide IV; TG-OCP, TG-OPP, TG-5LPGC-MS • TR-FFAP; TR-FAMEs; TG-GlyceridesLB; • TG-PAH, TG-PBDE, TR-PCB 8MS, TG-Dioxin; TR-Dioxin; TG-XLBMS; TG-Contaminants
Clinical/forensic/toxicology	• TG-ALC Plus; TG-ALC • TR-DoA35; TR-DoA5
Petrochemical	• TR-BioDiesel; TG-BioDiesel metal; TG-TCEP; TR-SIMDIST; TG-DHA50
System qualification test	• TG-SQC • TR-5

Wall-coated open tubular (WCOT) columns

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

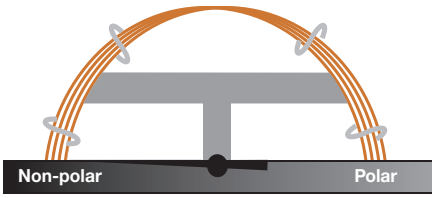
Application-specific columns

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	26058-3050
	60	5.0	Each	26058-5180

Applications:

- Volatile amines
- Air toxics
- Oxygenated volatiles

Similar to:

- CP-Volamine

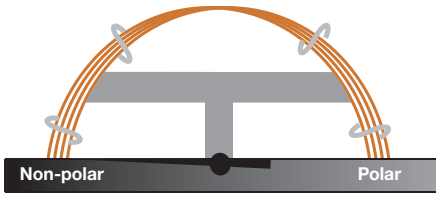
Application-specific columns

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



Phase:	Proprietary
Max. temp.:	260°C
USP listing:	NA

Thermo Scientific TraceGOLD TG-VMS GC columns

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

Applications:

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

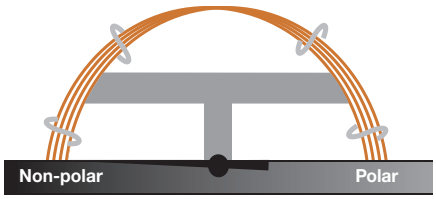
Similar to:

- 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



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	26081-4950
	40	1.0	Each	26081-4960
0.25	30	1.4	Each	26081-3320
	60	1.4	Each	26081-3330
0.32	30	1.8	Each	26081-3390
	60	1.8	Each	26081-3410

Applications:

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

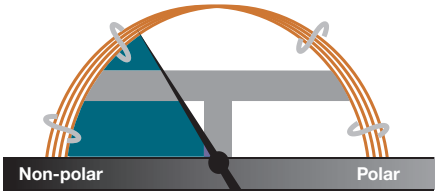
Similar to:

- 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



Phase:	6% cyanopropylphenyl polisiloane
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	260V495P
0.25	30	1.4	Each	260V332P
	60	1.4	Each	260V333P
0.32	30	1.8	Each	260V339P
	60	1.8	Each	260V341P
0.53	30	3.0	Each	260V396P

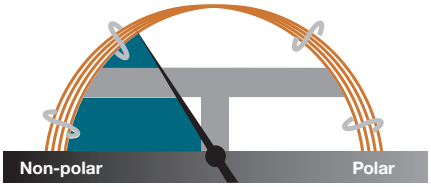
Applications:

- 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



Phase:	6% cyanopropyl phenyl / 94% dimethyl polysiloxane
Max. temp.	240°C
USP listing:	G43

Thermo Scientific TraceGOLD TG-624 GC columns

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

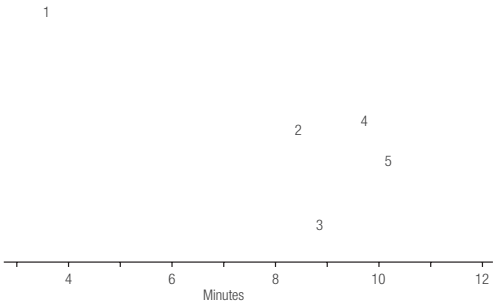
Applications:

- 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

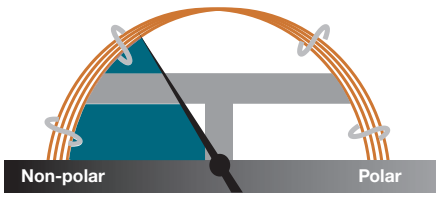
Temperature:	40 °C (20 minute hold) to 240 °C at 10 °C/min (20 minute hold)
Detector type:	FID
Carrier gas:	He
Flow rate:	2.15 mL/min
Injection volume:	1 mL
Injection mode:	Headspace, split (1:5), 140 °C

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

Thermo Scientific™ TraceGOLD™ TG-624SilMS 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



Phase:	6% cyanopropylphenyl/94% dimethyl arylene polysiloxane
Max. temp.	320°C
USP listing:	G43

Thermo Scientific TraceGOLD TG-624SilMS GC columns

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

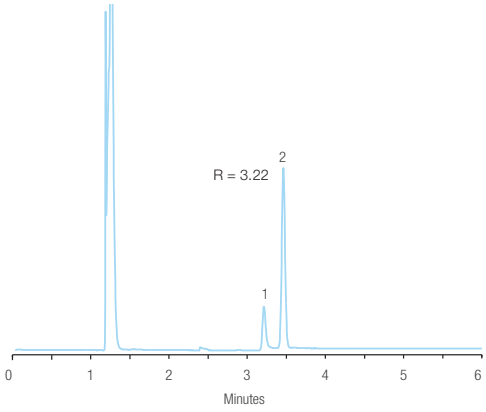
Applications:

- 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-624SilMS columns
30 m × 0.32 mm × 1.8 µm

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

1. Acetonitrile
2. Dichloromethane

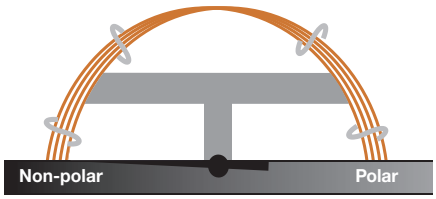
Application-specific columns

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 semivolaties in complex matrices
- Excellent reproducibility and peak shapes even for problematic compounds like phenol, nitrophenol, pentachlorophenol
- Long column lifetime
- Ideal for EPA method 8270



Phase:	Proprietary
Max. temp.:	340°C
USP listing:	G27, G36

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	26RV495P
TR-525	0.25	30	0.25	Each	26RX142P
TR-8095	0.32	12	0.25	Each	260P123P
TR-8270	0.25	30	0.5	Each	26RF223P

Applications:

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

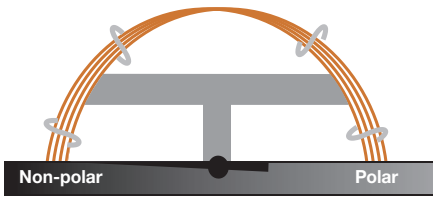
Application-specific columns

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



Phase:	Proprietary
Max. temp.:	400°C
USP listing:	N/A

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	26RF142F
TR-Pesticide II	0.25	30	0.25	5 m guard column attached	Each	26RD142F
TR-Pesticide III	0.25	30	0.25	5 m guard column attached	Each	26RC142F
TR-Pesticide IV	0.25	30	0.25	–	Each	26RC142P

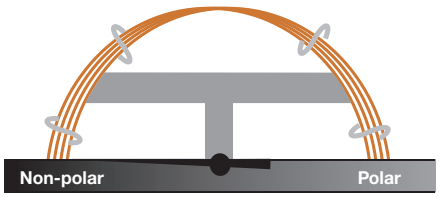
Applications:

- 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



Phase:	Proprietary
Max. temp.:	340°C
USP listing:	NA

Thermo Scientific TraceGOLD TG-OCP I GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	26078-1420
0.32	30	0.32	Each	26078-5760

Thermo Scientific TraceGOLD TG-OCP II GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.2	Each	26077-5720
0.32	30	0.25	Each	26077-1430

Applications:

- Organochlorine pesticides
- Herbicides

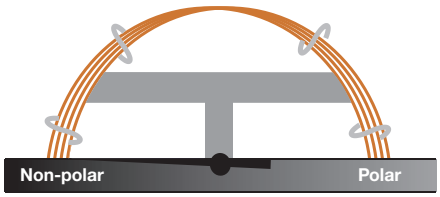
Similar to:

- 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



Phase:	Proprietary
Max. temp.:	330°C
USP listing:	NA

Thermo Scientific TraceGOLD TG-OPP I GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	26076-1420
0.32	30	0.5	Each	26076-2240

Thermo Scientific TraceGOLD TG-OPP II GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	26075-1420
0.32	30	0.32	Each	26075-5760

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	21098-2865
0.32	10	1.0	5 m, 0.15 mm ID	340 °C/340 °C	Each	21098-4425

Thermo Scientific™ TraceGOLD™ TG-624SilLPGC-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	21059-4435

Thermo Scientific™ TraceGOLD™ TG-35SilLPGC-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	21093-4415

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	21084-4425

Thermo Scientific™ TraceGOLD™ TG-17SilLPGC-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	21072-4415

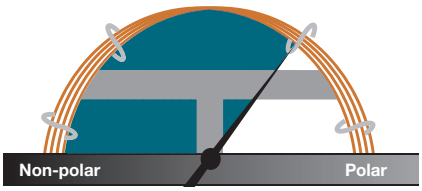
Application-specific columns

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



Phase:	TPA modified polyethylene glycol (PEG)
Max. temp.:	240°C/250°C
USP listing:	G25, G35

Thermo Scientific TRACE TR-FFAP GC columns

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

Applications:

- FFAP analysis
- Acidic compound analysis

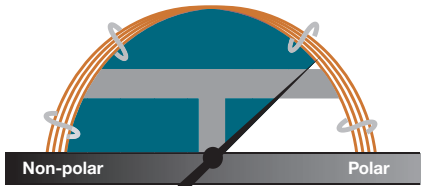
Application-specific columns

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 polisilphenylene-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	260M096P
0.22	30	0.25	Each	260M141P
	50	0.25	Each	260M147P
0.25	30	0.25	Each	260M142P
	60	0.25	Each	260M154P
	100	0.20	Each	260M238P
	120	0.25	Each	260M166L
0.32	30	0.25	Each	260M143P
	50	0.25	Each	260M149P
	60	0.25	Each	260M155P

Applications:

- FAMEs
- FAMEs cis/trans isomers

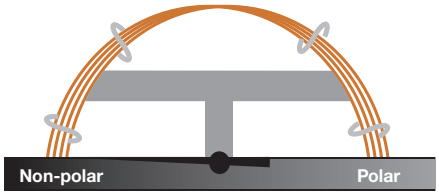
Application-specific columns

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 diglicerides

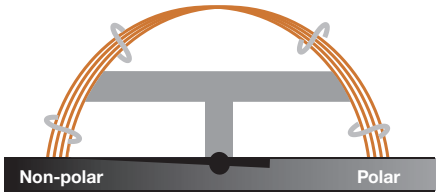
Application-specific columns

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



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

Thermo Scientific TraceGOLD TG-PAH GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.18	40	0.07	Each	26055-3570
0.25	30	0.10	Each	26055-0470
0.25	60	0.10	Each	26055-0120

Application:

- PAHs

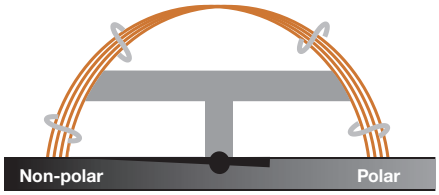
Application-specific columns

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



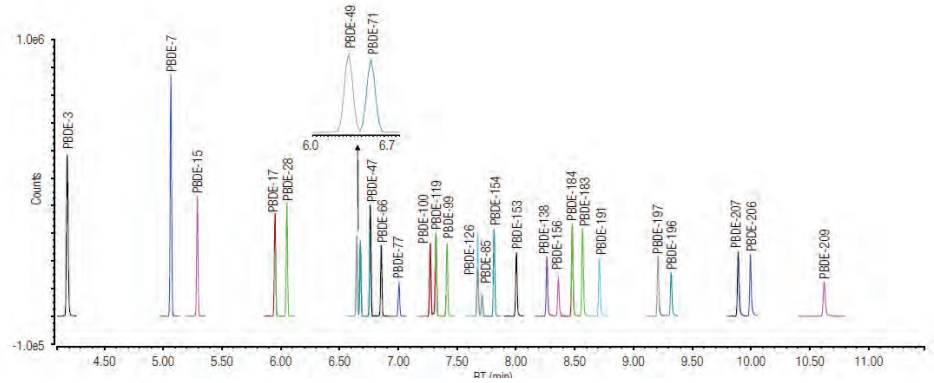
Phase:	Proprietary
Max. temp.:	360 °C
USP listing:	NA

Thermo Scientific TraceGOLD TG-PBDE GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.10	Each	26061-0350

Application:

- PBDEs



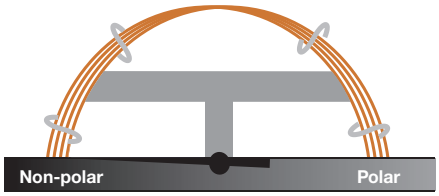
Application-specific columns

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	26AJ148P

Application:

- PCBs



Application-specific columns

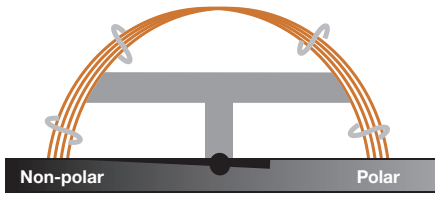
for dioxin and furan

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



Phase:	Proprietary
Max. temp.:	340°C
USP listing:	NA

Thermo Scientific TraceGOLD TG-Dioxin GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.18	40	0.18	Each	26066-4800
0.25	60	0.25	Each	26066-1540

Thermo Scientific TRACE TR-Dioxin 5MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	60	0.25	Each	26AF154P
0.25	30	0.10	Each	26AF047P
0.25	60	0.10	Each	26AF059P

Applications:

- Dioxins
- Furans

Similar to:

- Rtx-Dioxin2
- DB-Dioxin

Application-specific columns

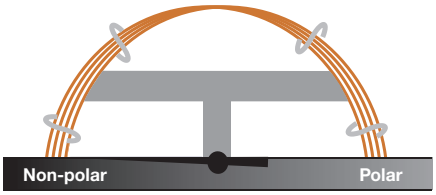
for contaminants

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	26079-5780
0.25	15	0.25	Each	26079-1300
	30	0.25	Each	26079-1420
		0.5	Each	26079-2230
	60	0.25	Each	26079-1540
0.32	30	0.25	Each	26079-1430
	60	0.25	Each	26079-1550

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	26056-0350

Application-specific columns

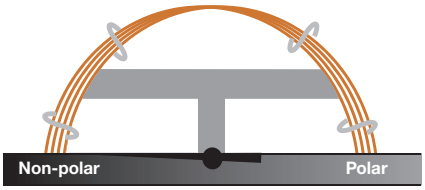
for blood alcohol analysis and postmortem examination

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



Phase:	Proprietary
Max. temp.:	260°C
USP listing:	NA

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	26063-3390
0.53	30	3.0	Each	26063-3960

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	26063-2240
0.53	30	1.0	Each	26063-2980

Applications:

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

Similar to:

- Rtx BAC Plus 1
- Rtx BAC Plus 2

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	26074-3390

Thermo Scientific TraceGOLD TG-ALC 2 GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.32	30	1.2	Each	26073-2260



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	26AC497P
TR-DoA5	0.25	15	0.25	Each	26AF130P

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	26AA395P
TR-BioDiesel (G)	EN 14105	0.32	10	0.1	Each	26AF024P
TR-BioDiesel (F)	EN 14103	0.25	30	0.25	Each	26AX142P
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

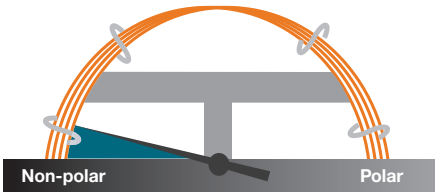
for system qualification

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



Phase:	Proprietary
Max. temp.:	330°C/350°C

Thermo Scientific TraceGOLD TG-SQC GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.25	Each	26070-1300
	30	0.25	Each	26070-1420

Thermo Scientific TRACE TR-5 GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.32	7	0.25	Each	260E113P

Applications:

- System qualification tests

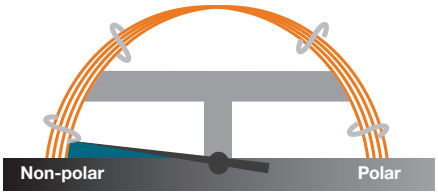
WCOT capillary columns

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



Phase:	100% dimethyl polysiloxane
Max. temp.:	330°C/350°C for standard columns 430°C for metal columns
USP listing:	G1, G2, G38

Thermo Scientific TraceGOLD TG-1MS GC columns

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

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	26099-1310
		1.0	Each	26099-2850
		3.0	Each	26099-3500
	30	0.25	Each	26099-1430
		0.5	Each	26099-2240
		1.0	Each	26099-2970
		3.0	Each	26099-4840
		5.0	Each	26099-3050
	60	0.25	Each	26099-1550
		0.5	Each	26099-2360
		1.0	Each	26099-3090
		3.0	Each	26099-6520
0.53	15	0.5	Each	26099-2130
		1.0	Each	26099-2860
		1.5	Each	26099-3340
	30	0.5	Each	26099-2250
		1.0	Each	26099-2980
		1.5	Each	26099-3360
		3.0	Each	26099-3960
		5.0	Each	26099-3530
	30 with 5 m SafeGuard	1.0	Each	26099-2985
	60	5.0	Each	26099-4100

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

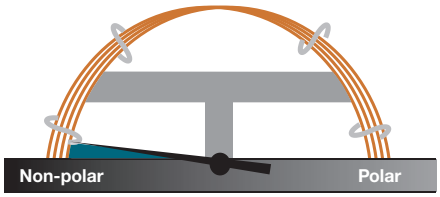
Thermo Scientific TraceGOLD TG-1MT Metal GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.25	Each	26M99-1300
	30	0.25	Each	26M99-1420
0.53	12	1.0	Each	26M99-0710
	10	2.65	Each	26M99-3480
	5	0.1	Each	26M99-4130
		0.88	Each	26M99-4120

Thermo Scientific™ TRACE™ TR-1 GC Columns

Designed for method development

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



Phase:	100% dimethyl polysiloxane
Max. temp.:	340°C/360°C
USP listing:	G1, G2, G38

Thermo Scientific TRACE TR-1 GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.25	Each	260A130P
	30	0.1	Each	260A047P
		0.25	Each	260A142P
	60	0.25	Each	260A154P
0.32	15	0.25	Each	260A131P
	30	0.25	Each	260A143P

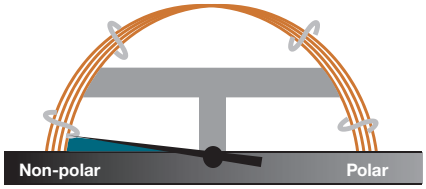
Applications:

- 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



Phase:	100% dimethyl polysiloxane
Max. temp.:	340°C/360°C
USP listing:	G1, G2, G38

Thermo Scientific TRACE TR-1MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.1	Each	260B047P
		0.25	Each	260B142P
	60	0.25	Each	260B154P
0.32	30	0.25	Each	260B143P
	60	0.25	Each	260B155P
		1.0	Each	260B309P

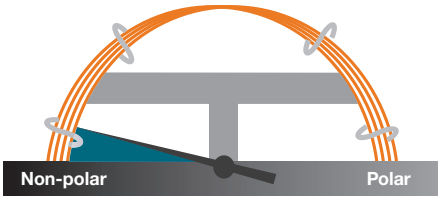
Applications:

- 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



Phase:	5% diphenyl/95% dimethyl polysiloxane
Max. temp.:	330° C/350° C for standard columns 430° C for metal columns
USP listing:	G27, G36

Thermo Scientific TraceGOLD TG-5MS GC columns

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

Applications:

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

Similar to:

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

TraceGOLD TG-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	26098-2850
		0.25	Each	26098-1310
	30	0.25	Each	26098-1430
		0.5	Each	26098-2240
		1.0	Each	26098-2970
	30 with 5 m SafeGuard	0.25	Each	26098-1435
	60	0.25	Each	26098-1550
		0.5	Each	26098-2360
		1.0	Each	26098-3090
		1.5	Each	26098-2320
0.53	15	0.5	Each	26098-2130
		1.0	Each	26098-2860
		1.5	Each	26098-3340
	30	0.25	Each	26098-1440
		0.5	Each	26098-2250
		1.0	Each	26098-2980
		1.5	Each	26098-3360
		5.0	Each	26098-3530
	60	5.0	Each	26098-4100

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

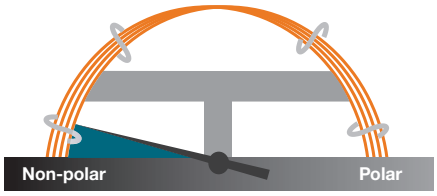
Thermo Scientific TraceGOLD TG-5MT Metal GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.1	Each	26M98-0350
	30	0.1	Each	26M98-0470
		0.25	Each	26M98-1420
	60	0.25	Each	26M98-1540

Thermo Scientific™ TraceGOLD™ TG-5SilMS GC Columns

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

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



Phase:	5% phenyl/95% dimethyl arylene polysiloxane
Max. temp.:	330°C/350°C
USP listing:	G27, G36

Thermo Scientific TraceGOLD TG-5SilMS GC columns

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

Applications:

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

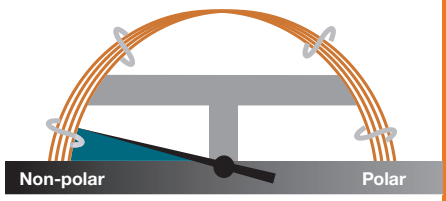
Similar to:

- DB-5ms Ultra Inert
- VF-5ms
- CP-Sil 8 Low-Bleed/MS
- Rxi-5SilMS
- 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	26095-0350
		0.25	Each	26095-1300
	30	0.1	Each	26095-0470
		0.25	Each	26095-1420
0.32	15	0.1	Each	26095-0360
	30	0.1	Each	26095-0480
		0.25	Each	26095-1430
0.53	10	0.15	Each	26095-1640
	30	0.15	Each	26095-0620

Applications:

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

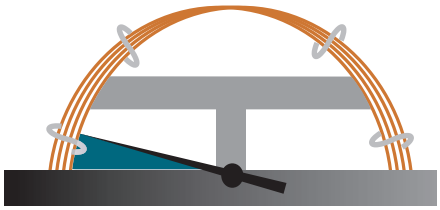
Similar to:

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

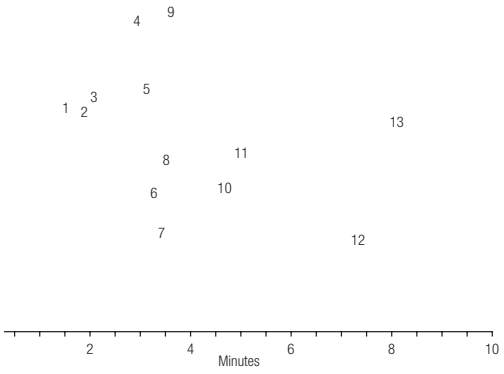
Applications:

- 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

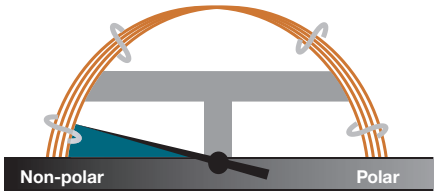
Temperature:	120 °C to 220 °C at 10 °C/minute
Detector type:	FID
Carrier gas:	Hydrogen
Flow rate:	40 cm/min
Injection volume:	1.0 µL
Injection mode:	Split 25:1, 300 °C

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

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



Phase:	5% phenyl methylpolysiloxane
Max. temp.:	320°C/340°C for films ≤ 1.5 µm 280°C/300°C for films > 1.5 µm
USP listing:	G27, G36

Thermo Scientific TRACE TR-5 GC columns

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

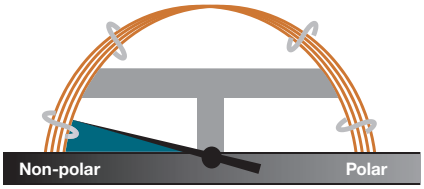
Applications:

- 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 polycarborane siloxane
- Allow the elution of higher-boiling hydrocarbons up to 100 °C
- Low bleed even at elevated temperatures



Phase:	5% phenyl polycarbonate siloxane
Max. temp.:	380°C/400°C
USP listing:	G27, G36

Thermo Scientific TRACE TR-5HT GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	15	0.1	Each	260H035P
	30	0.1	Each	260H047P
		0.25	Each	260H142P
0.32	12	0.1	Each	260H030P

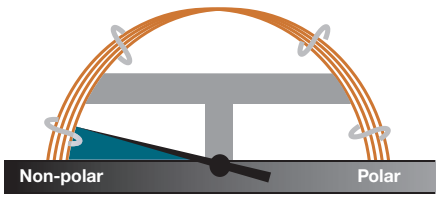
Applications:

- 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



Phase:	5% phenyl polysilphenylene-siloxane
Max. temp.:	360°C/370°C for films ≤ 1.5 µm 350°C/360°C for films > 1.5 µm
USP listing:	G27, G36

Thermo Scientific TRACE TR-5MS GC columns

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

Applications:

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

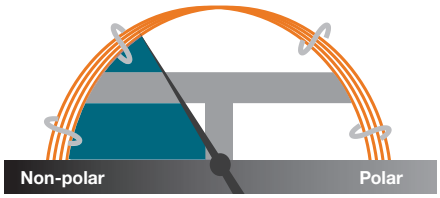
WCOT capillary columns

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



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	26094-5780
0.25	15	0.25	Each	26094-1300
	30	0.25	Each	26094-1420
		0.5	Each	26094-2230
0.32	30	0.25	Each	26094-1430
		0.5	Each	26094-2240
0.53	15	0.5	Each	26094-2130
	30	1.0	Each	26094-2980
		1.5	Each	26094-3360

Applications:

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

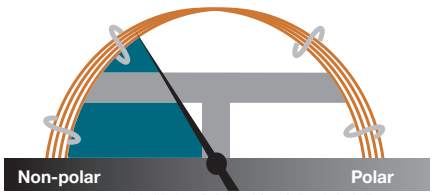
Similar to:

- 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



Phase:	Modified 35% diphenyl / 65% dimethylpolysiloxane for basic compounds
Max. temp.:	220°C
USP listing:	NA

Thermo Scientific TraceGOLD TG-35MS AMINE GC columns

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

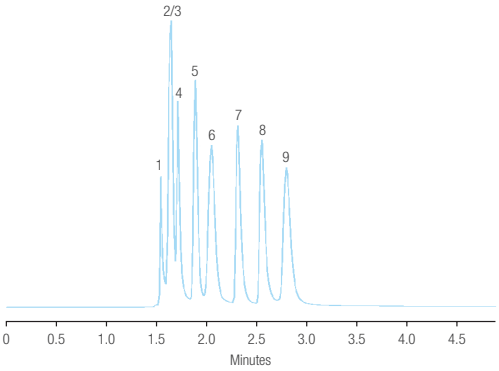
Applications:

- 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

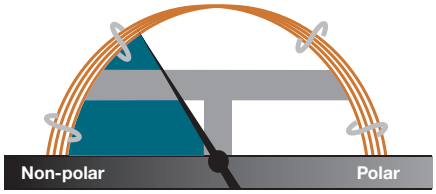
Temperature:	35 °C (5 minute hold) Isothermal
Detector type:	FID
Carrier gas:	He
Flow rate:	35 cm/sec
Injection volume:	1.0 µL
Injection mode:	Split (10:1), 250 °C

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

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



Phase:	35% phenyl polisilphenylene-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	260C142P
	60	0.25	Each	260C154P
0.53	15	1.0	Each	260C286P

Applications:

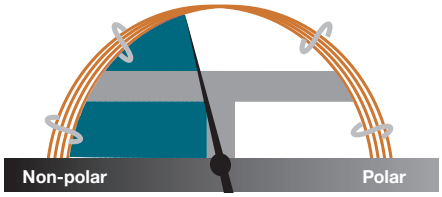
- Pesticides
- Herbicides
- Drugs of abuse
- PAHs
- Pharmaceuticals



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



Phase:	50% diphenyl/50% dimethyl polysiloxane
Max. temp.:	280°C/320°C
USP listing:	G3

Thermo Scientific TraceGOLD TG-17MS GC columns

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

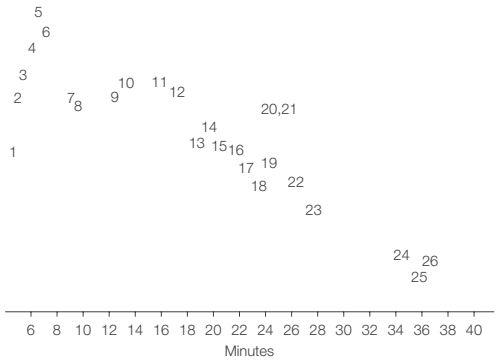
Applications:

- 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

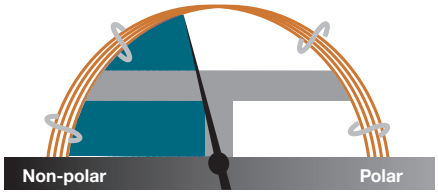
Temperature:	90 °C (1.0 minute hold) to 215 °C (0.5 minute hold) at 25 °C/minute to 235 °C at 4 °C/minute to 280 °C/ minute at 15 °C/minute to 320 °C (20 minute hold) at 4 °C/minute
Detector type:	MS
Carrier gas:	He
Flow rate:	1.2 mL/min
Injection volume:	1.0 µL
Injection mode:	Splitless, 300 °C

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

Thermo Scientific™ TraceGOLD™ TG-17SilMS 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



Phase:	50% phenyl/50% dimethyl arylene polysiloxane
Max. temp.:	340°C/360°C
USP listing:	G3, G17

Thermo Scientific TraceGOLD TG-17SilMS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.15	10	0.15	Each	26072-2750
0.18	20	0.18	Each	26072-5780
0.25	30	0.25	Each	26072-1420
	60	0.25	Each	26072-1540
0.32	30	0.25	Each	26072-1430

Applications:

- PAHs
- Pesticides and herbicides
- Phthalate ester
- Triglycerides

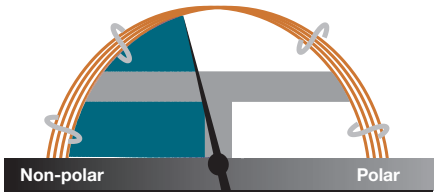
Similar to:

- 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



Phase:	50% phenyl polisilphenylene-siloxane
Max. temp.:	330°C/350°C
USP listing:	G3

Thermo Scientific TRACE TR-50MS GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	260R142P
0.32	30	0.25	Each	260R143P

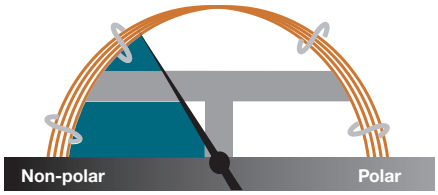
Applications:

- 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



Phase:	6% cyanopropyl phenyl/94% dimethyl polysiloxane
Max. temp.	260°C/280°C
USP listing:	G43

Thermo Scientific TraceGOLD TG-1301MS GC columns

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

Applications:

- Alcohols
- Volatile organics
- Oxygenates
- Residual solvents

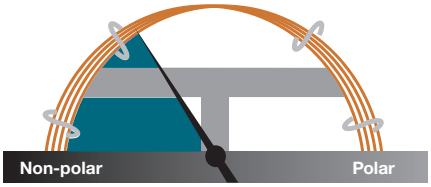
Similar to:

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



Phase:	6% cyanopropyl phenyl / 94% dimethyl polysiloxane
Max. temp.	240°C
USP listing:	G43

Thermo Scientific TraceGOLD TG-624 GC columns

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

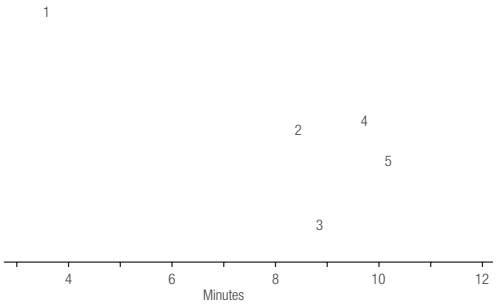
Applications:

- 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

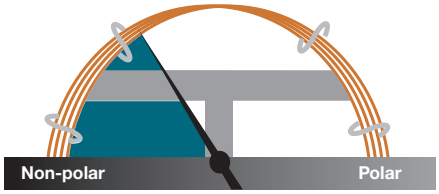
Temperature:	40 °C (20 minute hold) to 240 °C at 10 °C/min (20 minute hold)
Detector type:	FID
Carrier gas:	He
Flow rate:	2.15 mL/min
Injection volume:	1 mL
Injection mode:	Headspace, split (1:5), 140 °C

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

Thermo Scientific™ TraceGOLD™ TG-624SilMS 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



Phase:	6% cyanopropylphenyl/94% dimethyl arylene polysiloxane
Max. temp.	320°C
USP listing:	G43

Thermo Scientific TraceGOLD TG-624SilMS GC columns

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

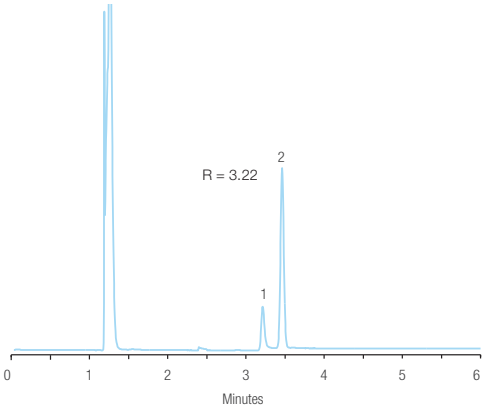
Applications:

- 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-624SilMS columns
30 m × 0.32 mm × 1.8 µm

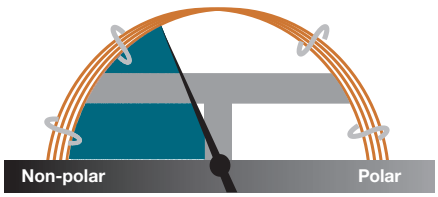
Temperature:	40 °C for 6 minutes
Detector type:	MS (ISQ); *m/z* 40,41 for Acetonitrile (1), *m/z* 49, 84 for Dichloromethane (2)
Carrier gas:	Helium
Flow rate:	1.5 mL/min
Injection volume:	500 µL
Injection mode:	Headspace, split (20:1) 220 °C

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



Phase:	14% cyanopropyl phenyl/86% dimethyl polysiloxane
Max. temp.	260°C/280°C
USP listing:	G46

Thermo Scientific TraceGOLD TG-1701MS GC columns

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

Applications:

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

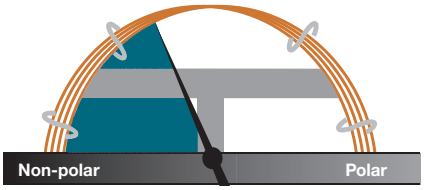
Similar to:

- 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



Phase:	14% cyanopropylphenyl polysiloxane
Max. temp.:	280°C/300°C
USP listing:	G46

Thermo Scientific TRACE TR-1701 GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	260Q142P
0.32	30	0.25	Each	260Q143P
0.53	30	1.0	Each	260Q298P

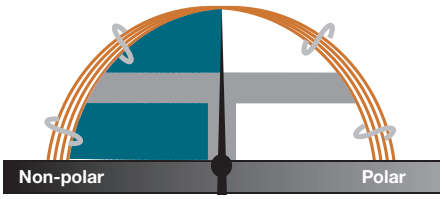
Applications:

- 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



Phase:	Trifluoropropylmethyl polysiloxane
Max. temp.:	320°C/340°C
USP listing:	G6

Thermo Scientific TraceGOLD TG-200MS GC columns

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

Applications:

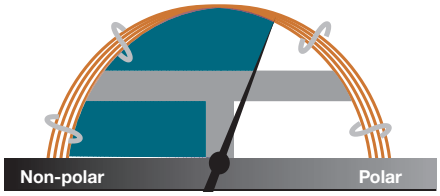
- Solvents
- Fluorocarbons
- Alcohols and ketones
- Silanes
- Glycols

Similar to:

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

WCOT capillary columns

High polarity



Phase:	50% cyanopropyl/50% phenyl methyl polysiloxane
Max. temp.:	220°C/240°C
USP listing:	G7, G19

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	26083-1420
	60	0.25	Each	26083-1540
0.32	30	0.25	Each	26083-1430

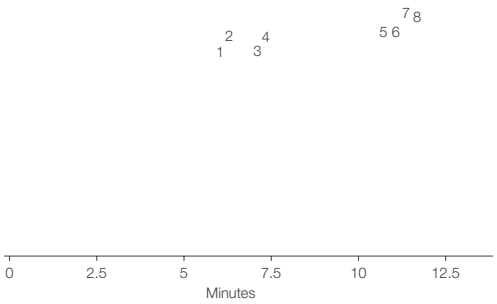
Applications:

- 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

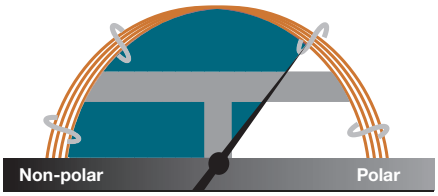
Temperature:	
190 °C (5 minute hold) to 250 °C at 8 °C/min (5 minute hold)	
Detector type:	FID
Carrier gas:	Hydrogen
Flow rate:	45 cm/sec
Injection volume:	0.5 µL
Injection mode:	Split (35:1), 260 °C

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



Phase:	Polyethylene glycol (PEG)
Max. temp.:	240°C/260°C
USP listing:	G14, G15, G16, G20, G39

Thermo Scientific TraceGOLD TG-WaxMS GC columns

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

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

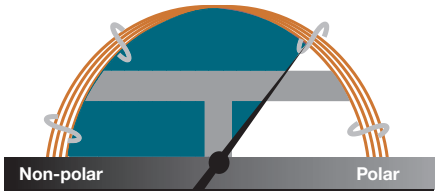
Thermo Scientific TraceGOLD TG-WaxMT Metal GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.25	30	0.25	Each	26M88-1420
	60	0.25	Each	26M88-1540

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



Phase:	Modified polyethylene glycol (PEG) for acidic compounds
Max. temp.:	240°C/250°C
USP listing:	G25, G35

Thermo Scientific TraceGOLD TG-WaxMS A GC columns

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

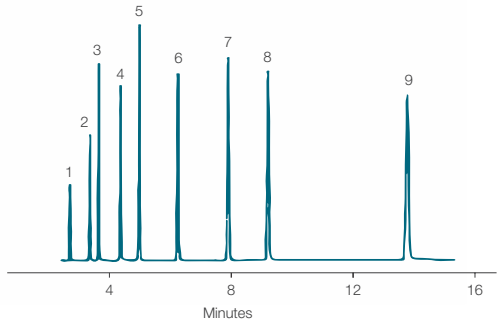
Applications:

- 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

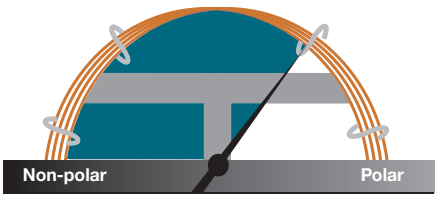
Temperature:	145 °C Isothermal
Detector type:	FID
Carrier gas:	Hydrogen
Flow rate:	40 cm/sec
Injection volume:	1.0 µL
Injection mode:	Split (50:1), 250 °C

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

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



Phase:	Modified polyethylene glycol (PEG) for basic compounds
Max. temp.:	200°C/220°C
USP listing:	NA

Thermo Scientific TraceGOLD TG-WaxMS B GC columns

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

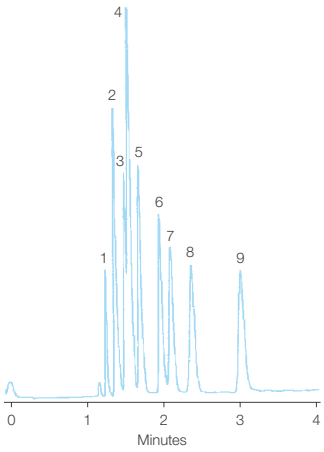
Applications:

- 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

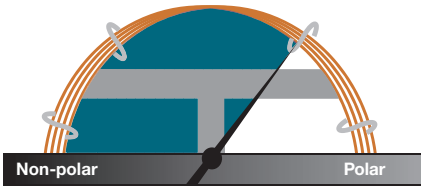
Temperature:	45 °C Isothermal
Detector type:	FID
Carrier gas:	Hydrogen
Flow rate:	40 cm/sec
Injection volume:	1 µL
Injection mode:	Direct Injection, 250 °C

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	260W142P
		0.5	Each	260W223P
		1.0	Each	260W296P
	60	0.25	Each	260W154P
0.32	15	0.25	Each	260W131P
	30	0.25	Each	260W143P
		0.5	Each	260W224P
		1.0	Each	260W297P
	60	0.25	Each	260W155P
		1.0	Each	260W309P
0.53	15	1.0	Each	260W286P
	30	0.5	Each	260W225P
		1.0	Each	260W298P

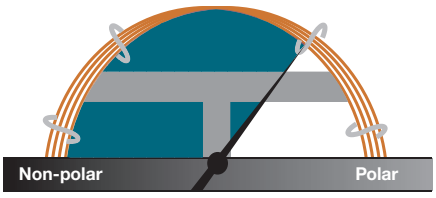
Applications:

- 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	260X142P
		1.0	Each	260X296P
	60	0.25	Each	260X154P
0.32	30	0.5	Each	260X224P

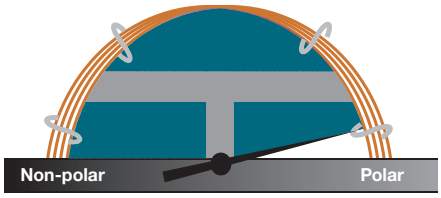
Applications:

- 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



Phase:	90% biscyanopropyl / 10% cyanopropyl phenyl polysiloxane
Max. temp.:	260°C/275°C
USP listing:	G8, G48

Thermo Scientific TraceGOLD TG-POLAR GC columns

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

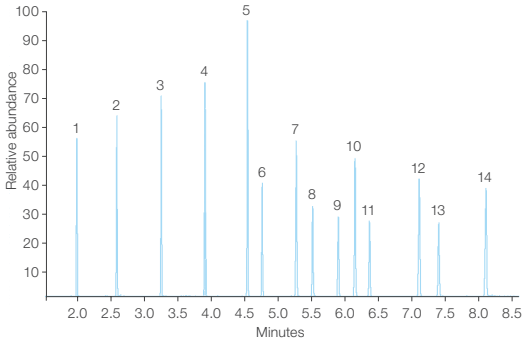
Applications:

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

PLOT capillary columns

Thermo Scientific™ TracePLOT™ TG-BOND Alumina GC Columns: Na_2SO_4 and KCl deactivation

Optimized for linear and quantitative analysis of polar unsaturated hydrocarbons

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

Thermo Scientific TracePLOT TG-BOND Alumina GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
Na_2SO_4 deactivation				
0.32	30	5	Each	26001-6020
	50	5	Each	26001-6050
0.53	30	10	Each	26001-6080
	50	10	Each	26001-6110
KCl deactivation				
0.32	30	5	Each	26002-6020
	50	5	Each	26002-6050
0.53	30	10	Each	26002-6080
	50	10	Each	26002-6110

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_2 and other permanent gases

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

Thermo Scientific TracePLOT TG-BOND Sieve 5A GC columns

ID (mm)	Length (m)	Film thickness (µm)	Quantity	Cat. no.
0.32	15	30	Each	26003-6010
	30	30	Each	26003-6040
0.53	15	50	Each	26003-6070
	30	50	Each	26003-6100
	50	50	Each	26003-1630

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	26004-6000
	30	10	Each	26004-6030
0.53	15	20	Each	26004-6060
	30	20	Each	26004-6090

Applications:

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

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	26006-6000
	30	10	Each	26006-6030
0.53	30	20	Each	26006-6090

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	26007-6000
	30	10	Each	26007-6030
0.53	30	20	Each	26007-6090

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	60180-860
PLOT Particle Trap (2.5 m × 0.53 mm)	0.53	Each	60180-861

Packed and micropacked columns

Molecular sieves

Commonly used for separting 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 Slilco 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 volatie 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.
TG-Packed Column 10%SE-30 DIATO-WAW	0.75	2	1/8	80/100	Each	**27014-7420**
TG-Packed Column 30%DC-200/500 CHR-PAW	0.4	2	1/8	80/100	Each	**1517538**
TG-Packed Column 30%DC-200/500 CHR-PAW	0.5	2	1/8	60/80	Each	**1518005**
TG-Packed Column 30%DC-200/500 CHR-PAW	0.6	2	1/8	60/80	Each	**27018-7410**
TG-Packed Column 1.5%OV-101 CHR-GHP	0.6	2	1/8	100/120	Each	**27017-7410**
TG-Packed Column 30%DC-200/500 CHR-PAW	0.66	2	1/8	60/80	Each	**1518077**
TG-Packed Column 1.0% OV-101 CHR-GAW	0.66	2	1/8	100/120	Each	**1518080**
TG-Packed Column 20%TCEP CHR-PAW	4.5	2	1/8	80/100	Each	**27015-7520**
TG-Packed Column 30%DC-200/500 CHR-PAW	7.3	2	1/8	80/100	Each	**1517539**
TG-Packed Column 30%DC-200/500 CHR-PAW	9.0	2	1/8	60/80	Each	**1518006**
TG-Packed Column 30%DC-200/500 CHR-PAW	10.6	2	1/8	60/80	Each	**27018-7540**
TG-Packed Column 30%DC-200/500 CHR-PAW	10,7	2	1/8	60/80	Each	**1518079**
TG-Micropacked Column 20%TCEP CHR-PAW	0.56	1	1/16	80/100	Each	**27016-7620**

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	26050-0225	—	—
0.32	2	Each	26050-0232	Each	26H50-0232
0.53	2	Each	26050-0253	Each	26H50-0253
0.25	5	Each	26050-0525	Each	26H50-0525
0.32	5	Each	26050-0532	Each	26H50-0532
0.53	5	Each	26050-0553	Each	26H50-0553
0.25	10	Each	26050-1025	—	—
0.32	10	Each	26050-1032	Each	26H50-1032
0.53	10	Each	26050-1053	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
Contains the following		
TraceGOLD TG-VMS GC columns (20 m x 0.18 mm x 1.00 µm)	Each	26080-4950
BTO septa 11 mm diameter (blister pack)	50/pack	31303233-BP
LinerGOLD split liner (1 x 6.3 x 78.5 mm)	5/pack	453A1335-UI
LinerGOLD splitless liner, single taper, wool (4 x 6.5 x 78.5 mm)	5/pack	453A1925-UI
Gold plated inlet seals, 0.8 mm	2/pack	290GA082
Liner sealing ring for SSL	5/pack	MI-290AA1-0001
Column nut for SSL and SSL Backflush	5/pack	35050458
Ferrules for 0.1-0.25 mm ID column	10/pack	290VA191
SureStop 2 mL screw silanized amber glass vial, Level 2	100 pack	6ASV9-S2P
SureSTART 9 mm screw caps	100 pack	6ASC9ST1
Thermo Scientific™ SureSTART™ EPA certified screw vial and cap kits	100 pack	6AK40AOTAS

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
Contains the following:		
TraceGOLD TG-5MS GC columns (30 m x 0.25 mm x 0.50 mm)	Each	26098-2230
BTO septa 11 mm diameter (blister pack)	50/pack	31303233-BP
LinerGOLD precisiom liner, wool (4 x 6.3 x 78.5 mm)	5/pack	453A1255-UI
LinerGOLD splitless liner, single taper, wool (4 x 6.5 x 78.5 mm)	5/pack	453A1925-UI
Gold plated inlet seals, 0.8 mm	2/pack	290GA082
Liner sealing ring for SSL	5/pack	29001320
Column nut for SSL and SSL Backflush	5/pack	35050458
Ferrules for 0.1-0.25 mm ID column	10/pack	290VA191
Thermo Scientific™ SureStop™ 2 mL screw silanized amber glass vial, level 2	100 pack	6ASV9-S2P
Thermo Scientific™ SureSTART™ 9 mm screw caps	100 pack	6ASC9ST1
Fixed-needle syringes for GC instruments	Each	36520060

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
Contains the following:		
TraceGOLD TG-Dioxin GC columns (60 m x 0.25 mm x 0.25 µm)	Each	26066-1540
BTO septa 11 mm diameter (blister pack)	50/pack	31303233-BP
LinerGOLD precision liner, wool, (4 x 6.3 x 78.5 mm)	5/pack	453A1255-UI
LinerGOLD splitless liner, single taper, wool (4 x 6.5 x 78.5 mm)	5/pack	453A1925-UI
Gold plated inlet seals for Agilent GC's, 0.8 mm	2/pack	290GA082
Liner sealing ring for SSL	5/pack	29001320
Column nut for SSL and SSL Backflush	5/pack	35050458
Ferrules for 0.1-0.25 mm ID column	10/pack	290VA191
Thermo Scientific™ GC SMART syringes	Each	365D0271-SM
Thermo Scientific™ SureSTART™ 1.7 mL high recovery glass screw top microvials	100 pack	6PSV9-v1
SureSTART 9 mm screw caps	100 pack	6ASC9ST1



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



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

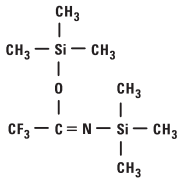
Why derivatize:

- 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



BSTFA
MW 257.4
bp 40°C/12 mm
d_4^{20} 0.961

- 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

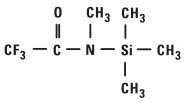
BSTFA and BSTFA + TMCS reagent

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

X indicates that hazardous shipping charges apply

MSTFA and MSTFA + 1% TMCS reagent

Offers maximum volatility



MSTFA
MW 199.1
bp 70°C/75 mm
d_4^{20} 1.11

- Trimethylsilyl donor strength comparable to BSA and BSTFA
- Reacts to replace labile hydrogens on a wide range of polar compounds with a Si(CH3)3 group
- Used to prepare volatile and thermally stable derivatives for GC and GC-MS
- Addition of Thermo Scientific TMCS aids derivatization of amides, secondary amines and hindered hydroxyls not derivatized by MSTFA alone

MSTFA and MSTFA + 1% TMCS reagent

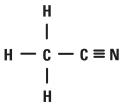
Description	Quantity		Quantity	Cat. no.
MSTFA	10 × 1 mL ampules		Each	TS-48910
	10 g		Each	TS-48911
	25 mL		Each	TS-48913
	100 mL	X	Each	TS-48914
MSTFA + 1% TMCS	10 × 1 mL ampules		Each	TS-48915

X indicates that hazardous shipping charges apply

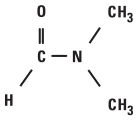
Silylation grade solvents

Manufactured to meet your exact silylation needs

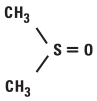
- Purified, dried and packaged under nitrogen in convenient 50 mL Hypo-Vial Sample Storage Vials
- Supplied with elastomer septa, allowing immediate access to the sample without exposure to moisture and oxygen
- Use polar solvents (acetonitrile, dimethylformamide, dimethylsulfoxide, pyridine, tetrahydrofuran)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



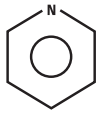
Acetonitrile
MW 41.05
bp 81.6°C



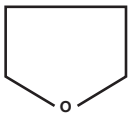
Dimethylformamide
MW 73.09
bp 153°C



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

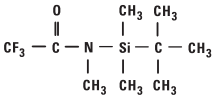
Description	Quantity		Quantity	Cat. no.
Acetonitrile	50 mL	X	Each	TS-20062
Dimethylformamide (DMF)	50 mL	X	Each	TS-20672
Dimethylsulfoxide (DMSO)	50 mL	X	Each	TS-20684
Pyridine	50 mL	X	Each	TS-27530

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



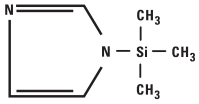
MTBSTFA
MW 241.3
bp 168-170°C
d_4^{20} 1.121

MTBSTFA and MTBSTFA + 1% TBDMCS reagent

Description	Quantity	Quantity	Cat. no.
MTBSTFA	5 mL ampules	Each	TS-48920
MTBSTFA + 1% TBDMCS	10 × 1 mL	Each	TS-48927
MTBSTFA	1000 mL	Each	TS-48929

TMSI (N-Trimethylsilylimidazole) reagent

The strongest silylator available for carbohydrates and steroids



TMSI
MW 140.26
bp 99°C/14 mm Hg
d_4^{20} 0.957

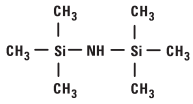
- Reacts quickly and smoothly with hydroxyls and carboxylic acids, but not with amines
- Used in the derivatization of alcohols, phenols, organic acids, steroids, hormones, glycols, nucleotides and narcotics
- Excellent for C1 through C5 fatty acids in serum and urine

TMSI reagent

Description	Quantity	Cat. no.	Quantity
TMSI (N-Trimethylsilylimidazole)	10 × 1 mL ampules	TS-88623	Each
	25 g	TS-88625	Each

HMDS (Hexamethyldisilazane) reagent

The popular choice for silylation of sugars and related substances



HMDS
MW 161.4
bp 125°C
n_d^{20} 1.4071

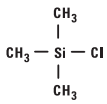
- Greatly extends the practical range of GC, improving chromatographic results
- Suitable for deactivating and coating chromatographic supports
- Monofunctional, making polymerization not possible and eliminating surface moisture

HMDS reagent

Description	Quantity	Quantity	Cat. no.
HMDS (Hexamethyldisilazane)	25 g	Each	TS-84770

TMCS (Trimethylchlorosilane) reagent

An excellent catalyst for difficult-to-silylate compounds



TMCS
MW 108.7
bp 57.6°C
d_4^{20} 0.858

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

TMCS reagent

Description	Quantity	Quantity	Cat. no.
TMCS	25 g	Each	TS-88530

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	TS-45950

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	TS-48999
Tri-Sil HTP reagent HMDS:TMCS:Pyridine (2:1:10)	50 mL	X	Each	TS-49001

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 from trimethylsilyl esters
- Organic acids to form trimethylsilyl esters
- Aromatic amides to form N-trimethylsilyl derivatives
- Amino acids to form both N- and O-trimethylsilyl derivatives
- Amines to form N-trimethylsilyl derivatives

Tri-Sil BP reagent

Description	Quantity	Quantity	Cat. no.
Tri-Sil BP reagent (2.5mEq/ mL BSA in pyridine)	25 mL	Each	TS-49012

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	TS-49016

Tri-Sil TP (TMSI:Pyridine) reagent

Derivatizes hydroxyl compounds, particularly carbohydrates

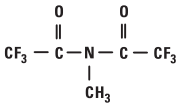
- Silylates alcohols and phenols, organic acids, hydroxylamines, amino acids, carbohydrates, flavonoids, glycols and polyglycols, nucleotides, steroids, hydroxyl acids, barbiturates, narcotics, indoles and vitamins
- Does not react with amines
- May be used with water as long as there is enough reagent 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	TS-49230
Tri-Sil TP reagent TMSI: Pyridine (1:4)	25 mL	Each	TS-49231

Acylation reagents

MBTFA reagent



MBTFA
MW 223.08
bp 123-124°C
d_4^{20} 1.55

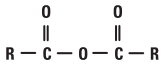
For trifluoroacylating primary and secondary amines, hydroxyl and thiol groups and carbohydrates

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

MBTFA reagent

Description	Quantity	Quantity	Cat. no.
MBTFA [N-Methyl-bis(trifluoroacetamide)	10 × 1 mL ampules	Each	TS-49700

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

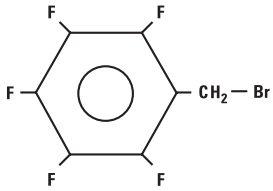
X indicates that hazardous shipping charges apply

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_4^{20} 1.86

Pentafluorobenzyl bromide (PFBBr) reagent

Description	Quantity	Quantity	Cat. no.
PFBBr (Pentafluorobenzyl Bromide)	5 g	Each	TS-58220

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	TS-49300
MethElute reagent (TMPAH)	12 × 1 mL ampules	Each	TS-49301

Siliconizing fluids

Water-soluble siliconizing fuid

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

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

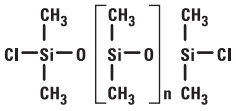
Water-soluble siliconizing fluid

Description	Quantity		Quantity	Cat. no.
Siliconizing Fluid-Water Soluble	120 mL	X	Each	TS-42799

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



Siliconizing Fluid – Hydrocarbon Soluble

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

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

Hydrocarbon-soluble siliconizing fluid

Description	Quantity		Quantity	Cat. no.
Siliconizing Fluid-Hydrocarbon Soluble	120 mL	X	Each	TS-42800
Siliconizing Fluid-Hydrocarbon Soluble	480 mL	X	Each	TS-42801

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	TS-18822
	Triple-block	Each	TS-18824
Remote temperature probe		Each	TS-18820

Reacti-Therm heating and stirring modules

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

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	TS-18825
27	Triple-block Reacti-Therm module**	Each	TS-18826

* 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
Reacti-Block A-1 Holds 13 x 0.3 mL or 1 mL Reacti-Vials; 13 holes/14 mm dia. × 23 mm deep		TS-18801
Reacti-Block B-1 Holds 9 x 3 mL or 5 mL Reacti-Vials; 9 holes/21 mm dia. × 32 mm deep		TS-18802
Reacti-Block C-1 Holds 13 x 3.5 mL screw cap septum vials; 13 holes/15 mm dia. × 34 mm deep		TS-18803
Reacti-Block Z-1 Holds 9 x 0.1 mL Reacti-Vials; 9 holes/12 mm dia. × 21 mm deep		TS-18804
Reacti-Block M-1 Holds 6 x 27.5 mL Reacti-Vials; 6 holes/28.5 mm dia. × 70 mm deep		TS-18811
Reacti-Block Q-1 Holds 8 x 10mL Reacti-Vials; 8 Holes (25 mm diameter x 46mm deep)		TS-18814
Reacti-Block S-1 Holds 13 x 13 mm dia. Test tubes; 13 holes/14 mm dia. × 45 mm deep		TS-18816
Reacti-Block T-1 Holds 9 x 16 mm dia. Test tubes; 9 holes/17 mm dia. × 45 mm deep		TS-18817
Reacti-Block U-1 Holds 8 x 20 mm dia. Test tubes; 8 holes/21 mm dia. × 45 mm deep		TS-18818
Reacti-Block V-1 Holds 17 Microcentrifuge Test tubes; 17 holes/11 mm dia. × 45 mm deep		TS-18819

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

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

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	TS-18914
0	200	Each	TS-18915

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	TS-18782
Reacti-Vap PTFE-Coated needles 102 mm (4in) length	9/pack	TS-18784
Reacti-Vap PTFE-Coated needles 152 mm (6in) length	9/pack	TS-18786
Replacement Luer-Lok fitting	Each	TS-18827
Replacement height adjustment knob	Each	TS-18829
Replacement metal rod	Each	TS-18831

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

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



Applications:

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

Thermo Scientific Reacti-Vial small reaction vials

Capacity	Quantity	Cat. no.
Amber		
1 mL	12/pack	TS-13097
5 mL	12/pack	TS-13099
Clear		
100 µL	12/pack	TS-13100
300 µL	12/pack	TS-13220
1 mL	12/pack	TS-13221
3 mL	12/pack	TS-13222
5 mL	12/pack	TS-13223
10 mL	12/pack	TS-13225

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	TS-12708
12	0.3 mL, 1 mL Reacti-Vial small reaction vials, 3.5 mL screw cap septum vials	72/pack	TS-12712
13	7 mL screw cap septum vials	72/pack	TS-12713
16	14 mL screw cap septum vials, 15 mL (0.5 oz.) screw cap bottles	72/pack	TS-12716
18	3 and 5 mL Reacti-Vial small reaction vials	72/pack	TS-12718
22	25 mL, 40 mL screw cap septum vials, 240 mL (8 oz.) screw cap bottles, 10 mL Reacti-Vial	72/pack	TS-12722

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	TS-12412
18	3 and 5 mL Reacti-Vial small reaction vials, 10 mL and 25 mL Reacti-Flask	72/pack	TS-12418

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	TS-13218
0.3 mL, 1.0 mL Reacti-Vials, 3.5 mL screw cap septum vial	72/pack	TS-13215
10 mL Reacti-Vials, 40 mL screw cap septum vials	72/pack	TS-13219

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	TS-13019
Clear color; 7.0 mL capacity	72/pack	TS-13028

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	TS-10135
27	Fits 40 mL screw cap septum vials	12/pack	TS-10130

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