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Thermo Scientific TraceGOLD GC Columns

User Guide

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Contents

Thermo Scientific TraceGOLD GC Capillary Column

User Guide

Introduction

Every effort has been made to ensure that the Thermo Scientific™ TraceGOLD™ GC Capillary Column reaches you and performs to the same high standard as when it left our factory. This guide provides information on the installation, specifications, care, and regeneration of the column, together with some tips to help improve your results.

1. Prior to installation

Ensure:

1. Gas filters are functioning.
2. All gas lines are leak tight.
3. Septa and inlet liner are clean (replace if necessary).
4. Correct fittings are available.

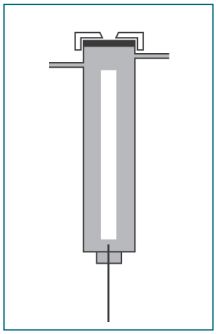
Note: Most GC applications use graphite, while GC-MS applications use graphite/Vespel or metal ferrules. For additional assistance in choosing correctly, please contact us for technical support.

5. The column is never heated without carrier gas flowing through.

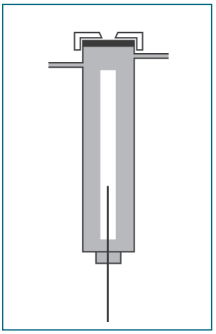
2. Installation

1. Place the nut and ferrule at the injector end of the column.
2. Using a Thermo Scientific™ Ceramic Column Cutter (P/N: 60201-318), score the surface of the injection end of the capillary column at a 90° angle to the column, a few centimetres from the end. Applying gentle pressure, snap the end off the column. This ensures any debris from end fittings, atmosphere or ferrule is removed from the column. Using a magnifying glass check for an even flat break. If the break is not square and clean, repeat the process.
3. The column must be inserted into the injector at the correct distance according to the recommendation of the instrument manufacturer. Please see Table 1 for recommendations on the Thermo Scientific range of instrumentation.
4. Hand-tighten the nut and then using a wrench further tighten one third turn.
5. Start the flow of carrier gas. Using a Thermo Scientific™ GLD Pro Gas Leak Detector (P/N: 66002-001), check the injector to ensure a leak tight connection has been achieved. Repeat Steps 1-5 for the detector end of the column.

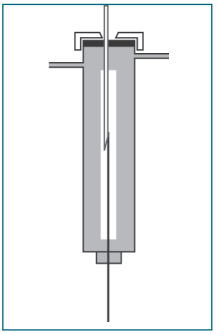
   Note: For correct insertion distance for the Thermo Scientific range of instruments, please refer to Table 1. For other makes of instrument, please consult the manufacturer's manual.
6. Check for leaks and make adjustments where necessary to obtain a leak tight system.



1. Not far enough, low sensitivity and sample transfer discrimination.



2. Too far gives insufficient mixing in the vaporisation leading to non-reproducible injection.



3. There is also danger of the syringe needle by-passing the column resulting in no peaks.

3. **Column conditioning**

It is recommended that before the column is subjected to any thermal gradients, all oxygen should be removed as the presence of oxygen in the system at elevated tempuratures can shorten the column lifetime. This can be achieved by purging the column with oxygen-free carrier gas for a minimum of 20 minutes at 40 °C using an approximate head pressure of 100 kPa.

Although all TraceGOLD GC columns have been pre-conditioned, we recommend that they be conditioned after installation.

1. Heat the column from 50 °C at 5 °C/min to a temperature 20 °C above the highest operating temperature of the method, or the column's maximum isothermal temperature, whichever is lower and hold for 1 hour. Please check the column's maximum isothermal temperature in Table 2.
2. Remember to stay within the maximum temperature range for the column.
3. Due to the factory pre-conditioning of the column, column conditioning should be achieved within 1 hour. This duration may be longer in the case of thick films and polar phases.

4. **Establishing a successful installation**

Every TraceGOLD GC column from Thermo Scientific has been individually tested and has passed our rigorous quality control tests. We recommend the performance of an injection of a "standard" sample to assess the success of installation. This standard should be a suitable mixture for the application that the column is to be used for. From the injection, select a parameter and record the performance for future reference. This injection can be repeated throughout the lifetime of the column to monitor its performance and judge cleaning and replacement intervals.

5. **When not in use**

If the column has been used for some time, especially with aggressive compounds, we recommend that it be conditioned prior to any long term storage. Please see Section 6 – Performance Recovery. Once conditioned, the column end should be sealed to prevent invasion of contaminants into the column. This can be done using Thermo Scientific™ Septa or Capillary Column End Caps (P/N: 260EC111).

6. **Performance recovery**

The performance of the column may exhibit signs of deterioration over time, which can be due to many different causes. Some of these, such as contamination by high boiling or strongly retained compounds, can be cleared by repeating the column conditioning step (Section 3) until a stable baseline is achieved.

Other contamination such as non-volatile compound or pieces of septa or ferrule can result in poor peak shape due to band broadening at the injection step. This can be cured by removal of a section from the front end of the column. The amount removed is dependent on the degree of contamination, the size of the injection, and the ID of the column, but generally 50 cm is sufficient. As the efficiency of the column is proportional to the square root of its length, the removal of the front end will not lower the separation effectiveness by the same ratio as 50 cm/column length.

Table 1 Reference information

Injector (SSL, HeS-SSL, SSLBKF, PTV, PTVBKF)

	Thermo Scientific™ TRACE™ 1300 Series GC	Thermo Scientific™ Focus SSL Instruments, Thermo Scientific™ Trace SSL Instruments
Split	10 mm	40 mm
Splitless	5 mm	64 mm
PTV	30 mm	30 mm
GSV	As far as it goes then withdrawn 2 mm	As far as it goes then withdrawn 2 mm

Detector

	TRACE 1300 Series GC	Focus SSL Instruments, Trace SSL Instruments
FID	As far as it goes then withdrawn 2 mm	97 mm
NPD	As far as it goes then withdrawn 2 mm	97 mm
FPD	125 mm	127 mm
ECD	23 mm	109 mm
TCD	As far as it goes then withdrawn 2 mm	As far as it will go
PDD	136 mm	123 mm
PID	N/A	135 mm (Ext Line 144 mm)

Detector

	Thermo Scientific™ ISQ™ 7000 GC-MS System, Thermo Scientific™ TSQ™ 9000 GC-MS/MS System	Thermo Scientific™ TRACE DSQ™/ DSQ™ II Series Single Quadrupole GC/MS, Thermo Scientific™ FOCUS DSQ™/ DSQ™ II Series Single Quadrupole GC/MS, Thermo Scientific™ ITQ™ Series GC/MS Ion Trap Mass Spectrometers, Thermo Scientific™ Polaris*Q*™ GC/MSn Benchtop Ion Trap Mass Spectrometer
MS	182 mm	270 mm

Table 2 Column Replacement Guide

Phase	Description	Column to Replace	* Max Temp °C (isothermal/ programmable)
TG-1MS	100% Dimethyl Polysiloxane	DB-1, DB-Petro, BP1, HP-1, HP-1MS, Rtx-1, Rxi-1MS, Ultra-1, SPB-1, SPB-1 Sulfur, Petrocol DH, CP-Sil 5CB, RSL-150, RSL-160, ZB-1, CB-1, OV-1, PE-1, 007-1(MS), SP-2100, SE-30, RH-1, CC-1, CP-Sil 5CB MS, VF-1ms	330 °C / 350 °C
TG-5MS	5% Phenyl Methylpolysiloxane	DB-5, DB-5MS, DB-5.625 XTI-5, BPX5, Rtx-5MS, Rtx- 5, SilMS, AT-5, AT-5MS, 007-5MS, SPB-5, CPSil 8CB, Ultra-2, HP-5, HP-5MS, HP5-TA, SPB-5, MDN-5S, VF-5ms, RSL-200, CB-5, OV-5, PE-5, 007-2(MP-5), SE-52, SE-54, PTE-5, CC-5, RH-5ms, ZB-5	330 °C / 350 °C
TG-5SilMS	Similar to 5% Phenyl Methylpolysiloxane	DB-5, DB-5MS, DB-5.625 XTI-5, BPX5, Rtx-5MS, Rtx- 5SilMS, Rxi-5SilMS, AT-5, AT-5MS, 007-5MS, SPB-5, CP-Sil 8CB, Ultra-2, HP-5, HP-5MS, HP5-TA, SPB-5, MDN-5S, VF-5ms, RSL-200, CB-5, OV-5, PE-5, 007-2(MP-5), SE-52, SE-54, PTE-5, CC-5, RH-5ms, ZB-5	330 °C / 350 °C
TG-5MS AMINE	Modified 5% Phenyl Methylpolysiloxane for Basic Compounds	Rtx-5MS Amine	305 °C / 315 °C
TG-5HT	5% Phenyl Methylpolysiloxane	DB-5HT, Rxi-5HT, DB-5, BP5, Rtx-5, HP-5, Ultra-2, PTE-5, SPB5, MDN-5, CP-Sil 8CB, SPB-5, AT-5, ZB-5, 007-2(MPS-5), SE-52, SE-54	380 °C / 400 °C
TG-SQC	5% Phenyl Methylpolysiloxane	N/A	330 °C / 350 °C
TG-1301MS	6% Cyanopropylphenyl Polysiloxane	DB-1301, HP-1301, Cp-1301, VF-1301ms, Optima-1301, SPB-1301, 007-1301	260 °C / 280 °C
TG-624	6% Cyanopropylphenyl Polysiloxane	DB-624, BPX Volatiles, Rtx Volatiles, Rtx-624, VOCOL 56, OV-624, AT-624, HP-VOC, CP-Select 624CB, 007-624, ZM-624	220 °C / 240 °C
TG-624SilMS	6% Cyanopropylphenyl Polysiloxane	DB-624, BPX Volatiles, Rtx Volatiles, Rtx-624, VOCOL 56, OV-624, AT-624, HP-VOC, CP-Select 624CB, 007-624, ZM-624	320 °C
TG-35MS	35% Phenyl Methylpolysiloxane	DB-35, DB-35MS, HP-35, HP-35MS,MDN-35, Rtx-35, SPB-35, BPX35	300 °C / 320 °C
TG-35MS AMINE	Modified 35% Phenyl Methylpolysiloxane for Basic Compounds	Rtx-35MS Amine	200 °C / 220 °C
TG-1701MS	14% Cyanopropylphenyl Polysiloxane	DB-1701, Rtx-1701, HP-1701, BP10, OV-1701, 007-1701, CP-Sil19 CB	260 °C / 280 °C
TG-17MS	50% Phenyl Methylpolysiloxane	OV-17, SP-2250, DB-17, DB-17ms, DB-17ht, BPX50, Rtx-50, Rxi-17MS, SPB-50, HP-50+, HP-17, AT50, RSL-300, PE-17, CC-17, 007-17(MPS-50), SPB-17, ZB-50	300 °C / 320 °C
TG-17SilMS	50% Phenyl / 50% Dimethyl Arylene Polysiloxane	OV-17, SP-2250, DB-17, DB-17ms, DB-17ht, BPX50, Rtx-50, Rxi-17MS, SPB-50, HP-50+, HP-17, AT50, RSL-300, PE-17, CC-17, 007-17(MPS-50), SPB-17, ZB-50	340 °C / 360 °C
TG-225MS	50% Cyanopropylphenyl Polysiloxane	DB-225, HP-225, RTX-225	220 °C / 240 °C
TG-200MS	Trifluoropropylmethyl Polysiloxane	DB-210, DB-200. VF-200ms, Optima-210, AT-210, 007-210, Rtx-200, Rtx-200M	320 °C / 340 °C
TG-WaxMS	Polyethylene Glycol (PEG)	DB-Wax, Rtx-Wax, Stabilwax, HP20M, BP20, HP-Wax, HPINNOWax, SUPELCOWAX 10, ATWax, Nukol, CP Wax 52CB, ZBWax	240 °C / 260 °C
TG-WaxMS A	Modified Polyethylene Glycol (PEG) for Acidic Compounds	DB-FFAP, HP-FFAP, Stabilwax-DA, CPWax-58CB, BP21	230 °C / 250 °C
TG-WaxMS B	Modified Polyethylene Glycol (PEG) for Basic Compounds	Stabilwax DB, CAM, Carbowax Amine, CP WAX 51	200 °C / 220 °C
TG-POLAR	90% Cyanopropylphenyl Polysiloxane	HP-88, CP Sil 88, BPX-70, SP-2330, SP-2331, SP2380, AT-Silar	260 °C / 275 °C

*** Maximum temperature may vary with different column film thickness. Refer to box label for more details.**

Useful chromatography resources

1. Our Chromatography Columns and Consumables catalog helps you find all of your chromatography needs in a single source. To order your copy visit **www.thermofisher.com/catalog** or **www.thermofisher.com/gc-columns**

2. Access the Chromatography Resource Center at **www.thermofisher.com/chromexpert** to acquire technical support, applications, technical tips and literature that help move your separations forward, quickly and easily.

3. Search **www.thermofisher.com/appslab** for the latest analytical application repository and download one-click eWorkflows. Search methods by compound, column, instrument or any key method parameter.

4. To order GC Columns and Consumables brochures and product specifications, or for more information please register at **www.thermofisher.com/columnsforgc**

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