

PLOT Columns

Instruction Sheet

Installation Instructions

1. Before removing the previously installed column from the gas chromatograph (GC), be sure to turn off the detector and cool all heated temperature zones.
2. Once all zones of the GC are cooled, turn off all gases. Remove the installed column, plug each end with silicone septa (or column end caps), and return the column to its original box.
3. Remove the new PLOT column from its box. Remove the septa (or column end caps) that are on each end of the PLOT column.

Important: If your column is tied onto the metal cage with high-temperature string, do not remove the string.

4. Attach the appropriate GC capillary nut (fitting) onto the inlet side of the column. Attach the appropriate GC column ferrule onto the inlet side of the column.

Fused silica columns:

0.25 mm columns, use 0.4 mm ID ferrule

0.32 mm columns, use 0.5 mm ID ferrule

0.53 mm columns, use 0.8 mm ID ferrule

MXT® columns:

0.25 mm and 0.32 mm columns, use 0.5 mm ID ferrule

0.53 mm columns, use 0.8 mm ID ferrule

Note: Do not install the capillary column nut (fitting) or ferrule onto the outlet side of the column at this time; this will be performed later.

Note: See Helpful Hints section for information on using particle traps.

5. Trim 2 cm from both ends of the column, making sure that a clean, square cut is obtained. Install the inlet side of the column into the GC injection port at the appropriate distance (see your GC manual to determine the correct installation distance).

6. Turn on the carrier gas flow, using Table I to determine an appropriate head pressure.

Note: A small amount of particles may exit the column when the carrier gas is first turned on. This is normal as particles can become dislodged when the column is cut, when a ferrule is tightened onto a column, or due to vibrations during transport.

7. Purge the column with clean, dry carrier gas for at least 20 minutes. During this purging step, check for leaks at the injector connections using an electronic leak detector (Restek Electronic Leak Detector, cat.# 22839). Note that the use of carrier gas traps is also highly recommended.

Important: If using hydrogen as the carrier gas, be sure to safely vent the gas exiting the column and the split vent.

8. Set the injection port temperature according to the method, but do not exceed the maximum operating temperature for the column. Set the GC oven to 40 °C.
9. Program the GC oven to heat up at 5 °C/min. up to the column's maximum temperature.
10. Once the column's maximum temperature is reached, hold this temperature for at least 60 minutes for porous polymer columns (Q-, QS-, S- and U-BOND), and for at least 2 hours for molecular sieve and alumina columns. Do not exceed 4 hours for any column.
11. Cool the GC oven. Do not turn off the carrier gas. Do not remove the inlet side of the column from the injection port.
12. Attach the appropriate capillary column nut (fitting) to the outlet side of the column. Attach the appropriate GC column ferrule to the outlet side of column. Trim an additional 1 cm from the outlet side of the column and verify that a clean, square cut is obtained. Before installing the column into the detector, pre-seat the ferrule onto the column using a capillary installation gauge (see www.restek.com for product selection). This will help prevent dislodged particles from entering the detector.
13. Install the column into the detector at the appropriate distance (see your GC manual to determine the correct installation distance). Confirm that your detector gases and electronics are turned on, then set the appropriate detector and injector temperatures for your analysis and allow them to stabilize. You are now ready to use the column.

Table I Approximate head pressures (at 40 °C) using hydrogen and helium.

Column Length	Internal Diameter	Head Pressure for Q-, QS-, S-, and U-BOND		Head Pressure for Msieve 5A and all Alumina BOND	
		Approx. psi	Approx. kPa	Approx. psi	Approx. kPa
15 m	0.25 mm	6.5	45	10	69
15 m	0.32 mm	3	21	6.5	45
15 m	0.53 mm	1.5	10	2	14
30 m	0.25 mm	9.5	66	11.5	79
30 m	0.32 mm	6	41	9	62
30 m	0.53 mm	2.5	17	3.5	24
50 m	0.25 mm	18	124	–	–
50 m	0.32 mm	10	69	14	97
50 m	0.53 mm	3.5	24	6	41

Helpful Hints

A. Never exceed the recommended maximum temperature of the column.

B. Column Regeneration

- Occasionally, alumina PLOT columns need to be regenerated to remove moisture. To regenerate, set the carrier gas head pressure as shown in Table I, set the GC oven temperature to 200 °C, and condition the column for 4 hours.
- Occasionally, molecular sieve PLOT columns also need to be regenerated to remove moisture. To regenerate, set the carrier gas head pressure as shown in Table I, set the GC oven temperature to 300 °C, and condition the column for 3 hours.

C. Protection from Particles

- If the PLOT column will be connected to a mass spectrometer (MS), the pressure drop (vacuum) may dislodge particles into the MS. To prevent particles from entering the MS, couple the detector end of the PLOT column to a restrictor (e.g. 5 m x 0.25 mm ID fused silica tubing coated with 0.25-0.50 µm of a nonpolar stationary phase, such as Rtx®-1 phase). Use a connector suitable for MS application.
- If the PLOT column will be connected to a non-MS detector, connecting a particle trap to the detector end of the column is recommended. For fused silica columns, particle trap catalog numbers are 19753 (for 0.32 mm ID columns) and 19754 (for 0.53 mm ID columns). For MXT® columns, a fused silica particle trap can be used with specific MXT® connectors (cat.# 21385 for 0.32 mm ID columns, cat.# 21384 for 0.53 mm ID columns).
- To ensure protection against particles flushing back into a valve/flow switching setup, connecting a particle trap to the injector end of the PLOT column is recommended. (See previous bullet for particle trap list.)

D. To prevent high boiling point compounds from contaminating a PLOT column, use of a precolumn (backflush column) or a valve/flow switching system should be considered.

E. If the PLOT column is connected using a valve/flow switching setup, it is recommended to condition the column as instructed under steps 6-11 (previous page) using 3 times higher gas flow to elute any loose particles. After column conditioning is complete, restore normal column flow and connect to the detector as described in steps 12-13 (previous page). Now your column is stable for valve/flow switching applications.

F. Please note that PLOT columns have a unique appearance due to the particle deposition on the inside wall of the columns. Variation in color and appearance is normal and does not affect performance.



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Chromatography Products

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ISO 9001:2008
cert.# FM80397

#600-55-001
Rev. date: 3/11

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