

How to Condition a New Capillary GC Column

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So, you've just purchased a new capillary column and you need to install it into your GC?

While many analysts have a routine that they perform, there are many new users who might not know the proper procedure. Here, we summarize proper column installation and conditioning. Note that detailed information about installing a capillary GC column is available in the article [Restek Capillary Column Installation Guide](#) on this website.

To begin, cool your GC and remove the old column. Don't discard it just yet – you might need it to troubleshoot the system if you encounter problems after installing the new column. Cap the ends of the old column with capillary column caps, or with pieces of used injection port septum, and put it aside.

Cut off the flame-sealed ends of the new column, work a fitting and ferrule 6-8 inches onto the injection port end of the column (the end at the front of the column cage as you are reading the column tag) and remove an additional 4 inches of column. This will remove any remaining stationary phase that had been heat-damaged during the flame sealing process, and eliminate ferrule fragments introduced into the column while you were installing the ferrule. Carefully insert the appropriate length of column into the injection port, as instructed in your instrument manual, tighten the fitting, turn on the carrier gas, and adjust the flow rate to the desired value (see Table 1). Confirm that there is flow through the column by submerging approximately 1 inch of the free end of the column in methanol, or other solvent compatible with the stationary phase in the column, and verify that a steady stream of bubbles is produced. Remove the end of the column from the solvent, then purge the column for 10-40 minutes at the appropriate carrier gas flow rate. When using helium or hydrogen as the carrier gas, purge as recommended in Table 1.

Table 1 Flow rates for purging capillary GC columns with helium or hydrogen carrier gas

Column ID (mm)	Minimum Flow Rate (mL/min.)	Minimum Purge Time (min.)
0.53	5.0	10
0.32	1.5	20
0.25	1.0	25
0.18	0.8	30
0.10	0.5	40

Purging will remove all traces of air (oxygen) from the injection port and column, which must be done before you heat the column. At elevated temperatures, even trace levels of oxygen will quickly cause irreversible damage to the stationary phase. During this purge, CHECK FOR LEAKS using an [electronic leak detector](#). To prevent oxygen from entering the system and damaging the column, the system must be completely leak free. In addition, the carrier gas must be passed through a [high-quality oxygen trap](#).

After purging, the column is ready to be conditioned. Do NOT connect the capillary column to the detector at this time. Conditioning time and temperature depend on several factors, including stationary phase chemistry, stationary phase thickness, the intended application for the column, and the type of detector you will be using. The following instructions should enable you to properly condition your new column. Note that the column conditioning times in Table 2 are **approximate**. The general rule is to condition the column only long enough to achieve a stable baseline and an acceptable signal-to-noise ratio for the compound peaks anticipated in the analysis. If you have questions, please call [Restek Technical Service](#) at 800-356-1688, ext. 4. We will help you to determine the best conditioning procedure for your new column – even if it isn't a Restek column.

Overnight conditioning is only recommended in a few situations. When a column will be used at its maximum operating temperature limit for extended periods of time (such as with simulated distillation analysis),

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