

## **Conditioning a Capillary and Packed Columns for Gas Chromatography Analysis**

Conditioning involves establishing a flow of carrier gas through a column and then heating the column to drive off contaminants. This makes the column fit for analytical use. This step is crucial to the optimal performance of any analytical method.

New packed columns should be conditioned, since they often contain volatile contaminants from the coating process. It may also be necessary to condition a used column that has been stored for some time without end caps or plugs.

New capillary columns do not contain as much stationary phase as packed columns, but it is still important to condition them. Most column manufacturers suggest that 6 volumes of helium be passed across the phase before temperature is applied. This will ensure that all of the oxygen is removed and that the phase will not be damaged.

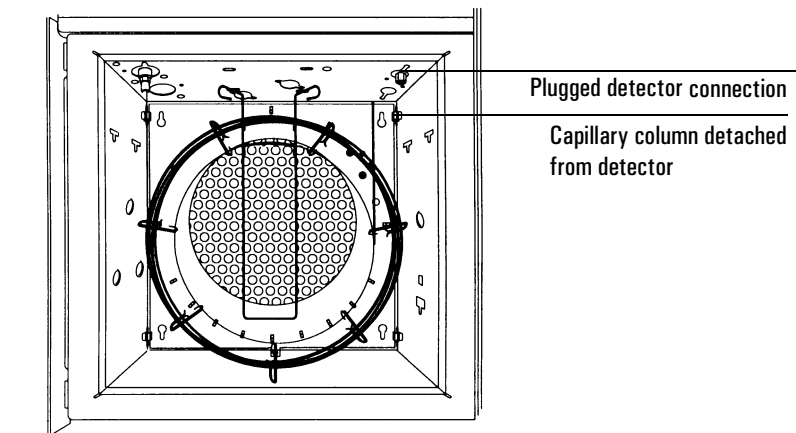
This document is believed to be accurate and up-to-date. However, Agilent Technologies, Inc. cannot assume responsibility for the use of this material.  
The information contained herein is intended for use by informed individuals who can and must determine its fitness for their purpose.

**Procedure: Preliminary column conditioning steps****Materials required**

Two 7/16-inch wrenches

No-hole ferrule and capillary nut for detector connection

1. Turn off the detectors. Shut off the detector support gases. It is especially important to shut off hydrogen!
2. If the column to be conditioned is not already installed, connect one end to an available inlet.  
DO NOT connect the remaining end to a detector!
3. If you plan to condition a capillary column in a split/splitless inlet, install the proper liner and attach the column in the normal manner, making sure about 5 to 7 mm of column extends above (in front of) the column ferrule.
4. Cap the detector(s) fittings with the no-hole ferrule and column nut.



**Procedure: Conditioning a capillary column****Procedure: Conditioning a capillary column****WARNING**

Do not use hydrogen as the carrier for conditioning! It could vent into the oven and present an explosion hazard.

1. Select an appropriate column pressure—given as **psi (kPa)**—from this table.

Length, m	Inside diameter				
	0.10 mm	0.20 mm	0.25 mm	0.32 mm	0.53 mm
10	25 (170)	6 (40)	3.7 (26)	2.3 (16)	0.9 (6.4)
15	39 (270)	9 (61)	5.6 (39)	3.4 (24)	1.4 (9.7)
25	68 (470)	15 (104)	9.5 (65)	5.7 (40)	2.3 (16)
30	83 (570)	18 (126)	12 (80)	7 (48)	2.8 (19)
50		32 (220)	20 (135)	12 (81)	4.7 (32)
60		39 (267)	24 (164)	14 (98)	5.6 (39)

2. Enter the selected pressure. Let gas flow through the column at room temperature for 15 to 30 minutes to remove air.
3. Program the oven temperature from room temperature to the maximum temperature for the column. Increase the temperature at a rate of 10 to 15°C/min and hold at the maximum temperature for 30 minutes.
4. If you will not be using the conditioned column immediately, remove it from the oven. Cap both ends to prevent air, moisture, and other contaminants from entering the column.

**Procedure: Conditioning packed columns****WARNING**

Do not use hydrogen as the carrier for conditioning! It could vent into the oven and present an explosion hazard.

1. Press [Col 1] or [Col 2] to open the column control table.
2. Enter an appropriate column flow:
  - 20 to 30 mL/min for 2 mm ID glass or 1/8 inch OD metal columns.
  - 50 to 60 mL/min for 4 mm ID glass or 1/4 inch OD metal columns.
3. The conditioning temperature is never greater than the maximum temperature limit for the column; 30°C less than the maximum is usually sufficient. Slowly raise oven temperature to the conditioning temperature for the column.

OVEN		
Temp	45	50
Init temp		50
Init time		5
Rate 1		15.00
Final temp 1		250
Final time 1		720.00
Mode: Constant flow		

4. Continue conditioning overnight at the final temperature. If you will not be using the conditioned column immediately, remove it from the oven. After removing the column, cap both ends to prevent air, moisture, or other contaminants from entering the column.