# Gas Chromatography (GC) Column Conditioning, Testing and Checks

In this technical tip we are pleased to bring you some valuable guidelines for Gas Chromatography (GC) related to installation, from column conditioning to installation testing and through leak checks. Ensuring proper column installation and performance is crucial for accurate and reliable analysis. Let's dive into some important good practices:

## Column Conditioning

• Allow sufficient time for the carrier gas to flow through the column to purge any oxygen that may be in the system.
• Raise the temperature of the column to the maximum isothermal operating temperature that is listed on your individual GC Column Test Report. Maintain this temperature until a constant baseline is achieved. Conditioning times will depend on the phase identity and thickness, with thicker films taking longer to stabilize. In order to minimize the downtime of the instrument, columns can be conditioned overnight at the maximum isothermal temperature.

## Installation Testing

• Inject a detectable unretained sample, such as methane for an FID, to determine dead volume time and linear gas velocity at the desired column temperature. Adjust gas pressure for optimal flow depending on carrier gas selection.
• The non-retained peak must have ideal peak shape or installation is faulty and needs to be redone.

## Checking for Leaks

Use a thermocouple-thermometer to check for leaks. It is highly sensitive to $H_2$, He, and $N_2$ and will not contaminate the instrument or column. Liquid leak indicators are not recommended for capillary columns. There is the risk of drawing the liquid into the column or fittings and contaminating the system.

Any carrier gas that is leaking from the column will alter the conductivity across the thermocouple. As such, just watch for fluctuations within the temperature reading, which would indicate a possible leak near the location of the thermocouple. This prevents any contact and possible contamination of the column.

Note: If Vespel® ferrules are being used, leakage can occur after the initial heating phase due to ferrule deformation. Be sure that the fitting is re-tightened after this initial heating phase, then carefully check all corrections for leaks.

Remember, following these practices will contribute to the optimal performance and longevity of your GC columns, reducing downtime due to system maintenance.