# Excessive Background Noise in GC

**This Information Applies To:** *Agilent GC Systems*

## Issue

Excessive baseline noise can be introduced at different points including sample preparation, sample introduction, separation, and the detector. The excessive background can cause reduced signal-to-noise (detection limit), creating inaccurate quantitative or qualitative results.

Other chromatographic problems are identified in Basic Troubleshooting for GC Systems. Regular maintenance of your instrument in accordance with the recommended maintenance schedule will reduce the incidence of chromatography problems.

## Background

Over time sample deposits can accumulate in the analytical pathway and slowly leach out during subsequent sample analyses (Figure 1). The background can be consistently high across the entire sample run, or vary with the temperature program, and can vary significantly when the instrument is run continuously and after sitting idle.

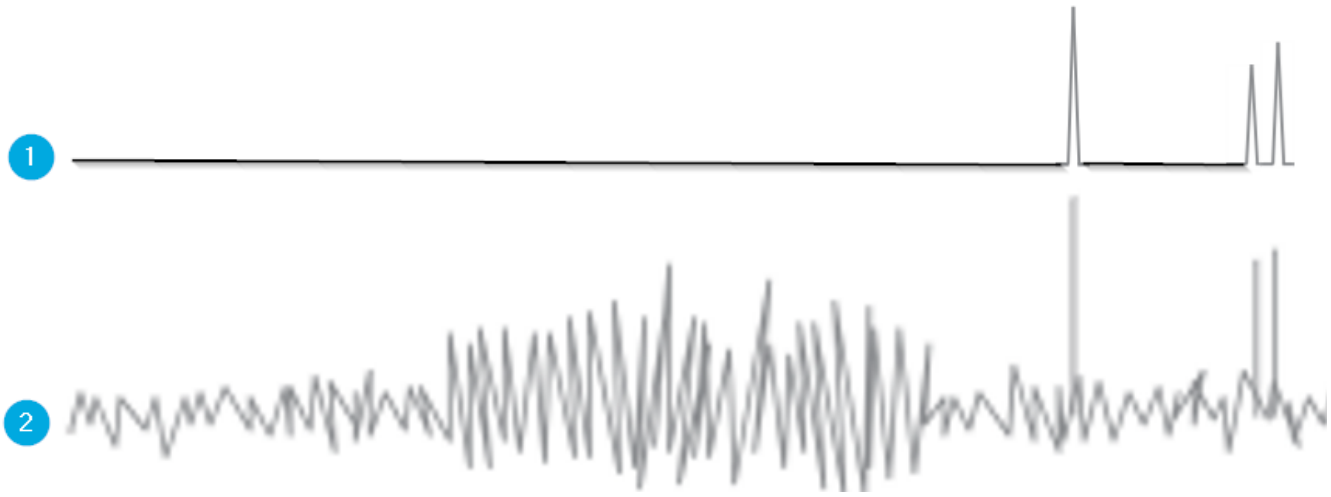


**Figure 1.** Excessive background noise

1. Normal background with peaks visible, 2. Excessive background with peaks partially obscured

## Resolution

| Possible source of background noise | Solution |
|---|---|
| Low quality or contaminated solvent | Check to see if the problems coincided with a change in solvent supply. If they did, change to a known contamination free solvent supply |
| Matrix effects from sample | Sample or extract clean up before the analysis |
| Sample contaminated during preparation (including contamination of solvent) | Check sample handling steps. Repeat sample preparation as necessary |

2. **Sample introduction system**

Perform the GC Condensation Test to determine if the sample introduction system is the source of the contamination.

| Possible source of contamination | Solution |
|---|---|
| Low quality or contaminated gas supply | Check to see if the problems coincided with a change in gas cylinder. If they did, change the gas cylinder and flush the gas lines for sufficient time to clear the volume of the gas system |
| Contaminated gas filter | Check the gas filter indicator (if available). If not, replace as per the maintenance schedule or after using contaminated gas |
| Septum bleed or degradation | Replace the septum. Use an Agilent high-quality septum appropriate for your inlet temperature. See Replacing the Inlet Septum for Split/Spitless and Multimode Inlets |
| Inlet liner dirty | Replace the inlet liner. Use an Agilent inlet liner appropriate for your injection volume, solvent, and injection mode |
| Gold seal is dirty | Replace the gold seal. See How to replace the Gold Seal on the Split/Splitless (SSL) Inlet for an Agilent GC |
| Inlet is contaminated | Clean or bake out the inlet. See How to Bake-out the Split/Splitless Inlet (SSL) on Agilent GC Systems |

3. **Analytical column**

| | |
|---|---|
| Column contamination | ⚠ **Caution**: Do not exceed the manufacturer recommended maximum column temperate limit as it will damage your column.<br>Trim the column: Remove 0.5 to 1 m from the front of the column |
| Column inserted too far/ not far enough into the detector | Remove and reinstall the column. See Capillary Column Installation Quick Reference Guide |

4. Detector

| Possible source of contamination | Solution |
|---|---|
| Detector contamination | Typically detector contamination increases over time and not suddenly. Clean the detector |
| Incorrect detector flow rates | Check that the flow rates are within recommended specifications |
| Detector leak (for MS, ECD, TCD) | Leak test the detector |
| Old detector filament, lamp, electron multiplier, or ion source | Review instrument logs. Clean or replace affected components |

If these procedures have not resolved the excessive baseline noise, contact Agilent Technical Support.

Learn how to effectively troubleshoot your Agilent GC System: GC-0GEN-1040z - Practical Steps in GC Troubleshooting **e-learning course available from Agilent education**

## Was this helpful?

## Still Need Assistance?

Contact Support Ask the Community