CHOOSING THE RIGHT GUARD CHIP FOR YOUR APPLICTION

How to Choose and Operate a Guard Chip

Choosing Between Guard and Jumper Chips

When operating the Agilent Intuvo 9000 GC system, there are four options for guard chips from which to choose: a guard chip or jumper chip for the split/splitless inlet, and a guard chip or jumper chip for the multimode inlet. The first decision to make is based upon the Intuvo configuration: split/splitless or multimode inlet. Once the inlet has been identified, there are a few guidelines when choosing between the guard chip and jumper chip. The most important factor in this choice is the cleanliness of the sample. For neat samples, applications with extensive sample preparation resulting in nearly neat samples, and applications using the headspace sampler, purge and trap, or thermal desorber, the jumper chip can be used. Since the jumper chip is significantly shorter than the guard chip, it acts as a simple conduit from the inlet to the rest of the flow path. Its length does not allow for any matrix trapping, and provides very little protection to downstream components from dirty samples. However, the smaller dimensions of the jumper chip allow the user to further reduce extra column band broadening, which can be useful when using small inner diameter columns.

If the sample being injected is not neat, or has any level of matrix contamination, choose the guard chip. Its longer flow path and larger dimensions make it well equipped to trap matrix contamination, and offers protection to downstream components.

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Operation of Guard and Jumper Chips

The guard chip or jumper chip is a parameter in an Intuvo method that must be set for successful operation of the GC. The jumper chip can be operated using the **Ramped Temperature** mode, and held at the same temperature as the inlet (Figure 1).

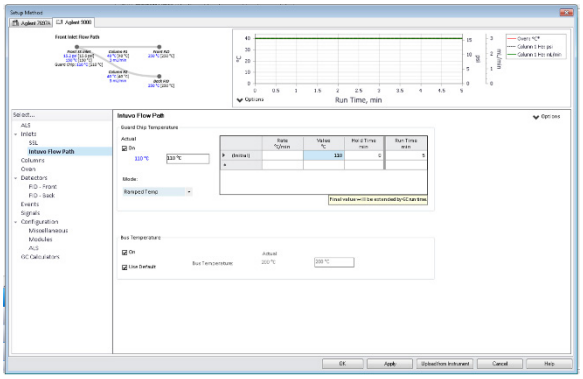

Figure 1. Operating the jumper chip at the same temperature as the inlet, 110 °C for this headspace method, is recommended.

Since the jumper chip is not being relied upon to trap matrix, holding the device at an isothermal temperature will allow the highest throughput.

The guard chip is often operated in **Track Oven** mode (Figure 2).

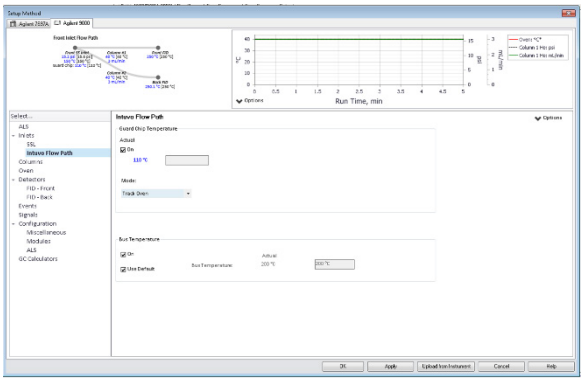

Figure 2. Operating the guard chip in the default, **Track Oven**, mode provides the highest matrix trapping efficiency.

This automatically ramps the guard chip at a rate equivalent to the column program rate. This mode is the default selection when building a new Intuvo method, and provides the best starting point for Intuvo methods going forward. Ramping the guard chip ensures the highest level of matrix trapping efficiency, and provides the best method for preventing contamination of the column by dirty matrix.

Replacing the Guard Chip

Applications that use a jumper chip are less likely to need frequent replacements. The nature of these analyses, neat or very clean samples, do not foul the system as quickly as other samples, and allow for a longer lifetime of this consumable. Guard chips are used when the sample is dirty or matrix is involved. Because of this, replacing the guard chip is a necessary maintenance step to preserve chromatographic fidelity and ensure system longevity. Depending on the matrix, it is recommended that the guard chip on the Intuvo system is replaced at the same interval as trimming the column on conventional GC platforms. For example, if the previously established method trimmed the capillary column every 3 days, guard chip replacement should occur every 3 days as well. If an SOP exists for the application of interest that monitors continuing calibration or quality control samples, the maintenance schedule should be based on those metrics.

Conclusions

Choosing and operating the jumper or guard chip is easily determined by following a few simple rules:

- Systems running samples that are dirty should use a guard chip.
- Operating the guard chip in Track Oven mode is recommended for samples with matrix.
- Replacement of the guard chip should follow the chip-per-clip rule. Replace the guard chip when the capillary column would normally be trimmed.

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