

## GC-MS

# How NeverVent technology enables consistent uptime for continued lab operation

### Benefit summary

- Eliminates unnecessary downtime
- Maintains productivity
- Simplifies maintenance
- Enables disruption-free ionization type change
- Increases ROI

### What is NeverVent technology and how does it work?

Thermo Scientific™ NeverVent™ technology is unique to Thermo Fisher Scientific's GC-MS products. It allows for routine maintenance, exchange of ionization mode, and direct probe work to be performed without the need to break the vacuum of the mass spectrometer:

- **Removing/replacing the ionization source:** Utilizing the vacuum probe interlock (VPI) in combination with an isolation valve, the ionization source can be removed from the system without venting the MS. The source can either be cleaned or replaced with a spare clean source, and samples can be run without long stabilization times which would be required if the system was vented.
- **Changing ionization type:** Using the VPI, the ionization source can be replaced with a different type of ionization source, for example, switching from Electron Ionization (EI) to Chemical ionization (CI) within a few minutes.
- **Using direct sampling probes:** The VPI also allows the use of direct probes on some NeverVent GC-MS systems. This enables direct sampling into the MS system, bypassing the GC separation, and is useful in compound characterization and when analyzing very difficult to volatilize samples like oils or metal complexes.
- **Changing the GC column without venting:** When performing common column maintenance like trimming, or replacing the column entirely, the V-Lock Source Plug allows the MS to be sealed off from inside the manifold. Columns can be exchanged or maintained without ever breaking vacuum.

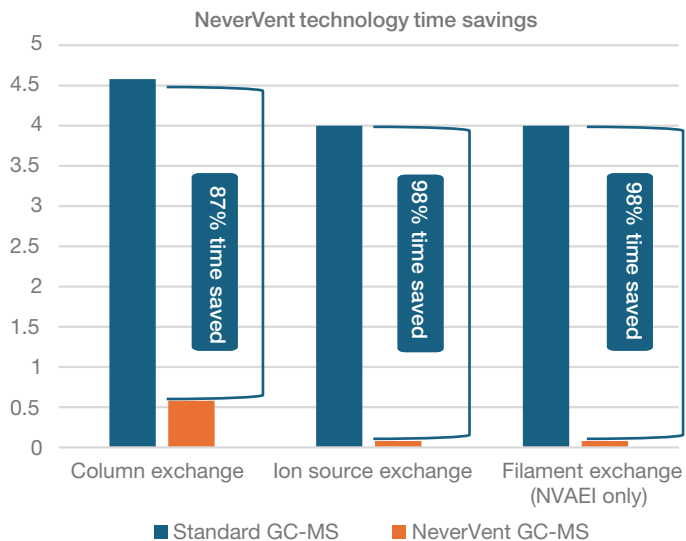


Figure 1. Use of the NeverVent technology on the TSQ 9610 mass spectrometer

### What are the benefits to NeverVent technology?

NeverVent technology allows a significant increase in instrument uptime. On a traditional GC-MS when performing maintenance, such as ionization source cleaning or column exchange, the MS must be vented. Venting the MS introduces air and moisture into the system. Once the maintenance is performed, the system is then pumped back down to vacuum and a stabilization period is required to ensure air and moisture are evacuated from the system. This process often takes overnight to complete and means samples cannot be run until the following day.

Due to the unique design of a NeverVent GC-MS system, the vacuum is maintained which means samples can be run shortly after the maintenance is performed. This could be the difference between running a batch of samples overnight or waiting for a system to be ready to run. Utilizing NeverVent technology eliminates unnecessary instrument downtime due to venting the systems during maintenance, thus increasing productivity. Figure 2 highlights the time savings that can be achieved with NeverVent technology.



For a typical GC-MS system where maintenance on the source is performed every three months, NeverVent technology can give you an extra four days of operation per year. When adding in column and ionization mode changings, the productivity gains are even more significant.

### Putting NeverVent technology to the test

To demonstrate the productivity gains achieved with NeverVent technology, the Thermo Scientific™ TSQ™ 9610 GC-MS/MS system was run continuously for 500 injections. At this point, even though the system was still performing well, the source was removed and cleaned. The process took around 20 minutes, which could be shortened if a spare ionization source was implemented. Figure 3 shows the instrument performed consistently after the routine maintenance without the need to wait for the instrument to stabilize before injecting samples.

Figure 2. Time savings with NeverVent technology in comparison to traditional GC-MS

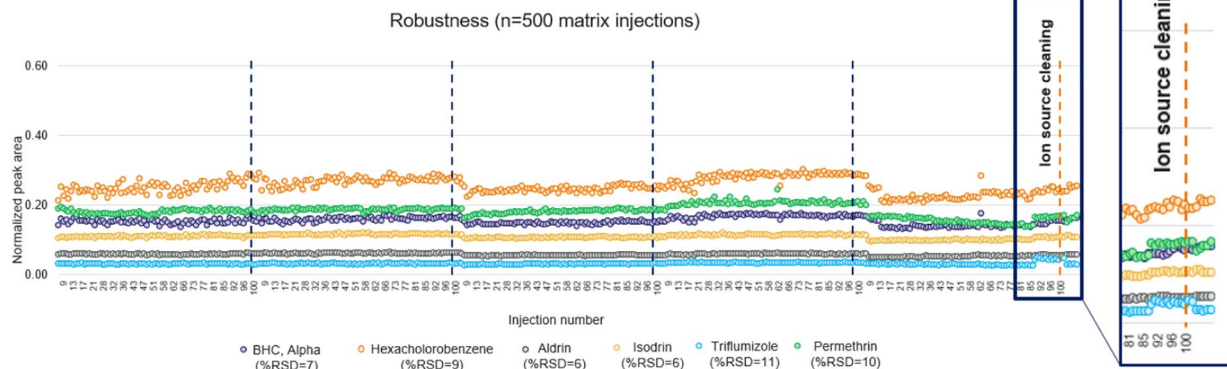


Figure 3. Normalized peak area response (analyte peak area / ISTD peak area) obtained for n=500 consecutive injections of matrix samples spiked at the default MRL (10 µg/kg). After 500 injections, the ionization source was removed and cleaned. Response was unaffected.

### NeverVent technology is available on these product lines



ISQ 7610 GC-MS



TSQ 9610 GC-MS/MS



Orbitrap Exploris GC mass spectrometer

#### Reference

1. AppsLab Library: Confident analysis of ultra-trace pesticides residues in baby food using triple quadrupole GC-MS

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