Gas Clean Filters

For chromatography, ICP, and TOC

Delivering clean gases for accurate analyses

The Measure of Confidence

Agilent Technologies

Enhanced gas quality for maximum productivity

The Agilent Gas Clean Filter System delivers clean gases, reducing the risks of column damage, sensitivity loss, and instrument downtime.

Contaminants in gases can significantly affect your analysis. Oxygen, hydrocarbons, and moisture can cause loss of sensitivity and accuracy of the GC and damage your column. Impurities activate glass wool in liners and accelerate septa degradation, causing high background signals and ghost peaks and leading to time-consuming troubleshooting. Oxygen in the supply gas for ICP-OES or ICP-MS can cause plasma shut-down and loss of sensitivity. Carbon dioxide in supply gas for TOC analyzers causes elevated baselines and loss of sensitivity and accuracy.

Supply gases can pick up contaminants from every part of the gas line. You therefore need a Gas Clean Filter System even if your supply gas is of the highest quality – it is not economical to buy expensive, high purity gases if their quality is downgraded by impurities in the gas line.

Examples of the Gas Clean Filter range, showing the 4-position connecting unit for ease of operation.

Agilent introduces a range of Gas Clean Filters and related components:
GC/MS Filter – provides faster stabilization times to reduce gas consumption (see Figure 1)
Moisture Filter – delivers faster stabilization times for increased productivity in GC
Process Moisture Filter and connecting unit – designed for use with acetylene in process GC
Carbon Dioxide Filter – eliminating CO_2 from supply gas, to minimize loss of sensitivity and improve accuracy in TOC
High flow connection unit – for applications up to 20 L/min, including ICP-OES, ICP-MS, and LC/MS

Fast stabilization and replacement

Fast stabilization

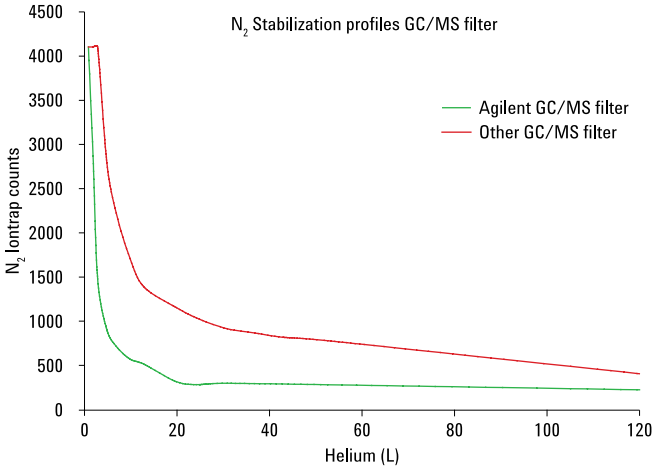

Figure 1. *Shows the fast stabilization rate (the N_2 mass measured by mass spectrometry) of a GC/MS after replacement of the filter.*

Reduced impurities for improved analysis

Inserting a Gas Clean Filter System in the gas line immediately before the instrument inlet greatly reduces the level of impurities, thus improving trace analysis (see Figure 2). Contaminants entering your GC column will also be reduced, which is critical for high temperature analysis and essential for longer column lifetime.

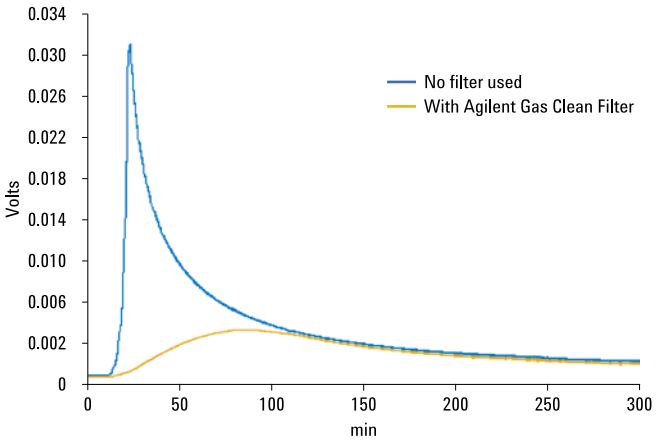

Figure 2. *Shows the difference in bleed levels of two GC columns due to moisture exposure with and without a filter when running a temperature program (50 °C to 350 °C, 20 °C/min). When no filter is used, an extreme rise in the bleed profile is clearly visible due to moisture in the carrier gas. By using Gas Clean Filters, a normal bleed profile is achieved with the removal of all moisture in the carrier gas.*

Fast, leak-free filter replacement for superb performance

Every Gas Clean Filter features a unique connection design that permits easy filter replacement. The connecting unit shown in Figure 3 allows the instrument to remain under pressure during filter changeover and prevents air from entering the system. Changing a Gas Clean Filter is easy, requiring no tools or gas shut-off, unlike in-line filters.

The Technischer Überwachungs-Verein (TÜV*) certificate** assures safe use up to 15 bar (217 psi). A TÜV certificate at this level is unique to our design and guarantees the highest quality of Gas Clean Filters.

* TÜV NORD Group has expertise in technical safety, environmental protection, and the conformity assessment of management systems and products – nationally and internationally. ** Certificate number 973/980538 hel-CHROMP1.doc.

Fast replacement

Figure 3. *The unique connection design allows fast, leak-free replacement of the Gas Clean Filter.*

Highest performance

Gas Clean Filter indicators are more sensitive

Replacing the filters when they have reached absorption capacity ensures maximum protection of your GC columns and analytical hardware. The sensitive indicators change color, alerting you that the filter needs to be replaced.

In Figure 4, the open-topped glass tube on the left contains the Gas Clean moisture indicator (green) packed below another manufacturer's indicator (yellow). On the right is the same tube after exposure to air at room temperature with average moisture content. As the moisture penetrated the tube downwards, it passed through the other manufacturer's indicator before it reached the Gas Clean indicator at the bottom. The tube on the right shows that the Gas Clean indicator changed color from green to pale brown, revealing the presence of moisture. However, the other indicator failed to change color, confirming that the Gas Clean moisture indicator is a great deal more sensitive.

With the Gas Clean Filter System, you can be completely confident that your gas supply contains less than 0.1 ppm of moisture. The system will not suffer from hydrolization damage, saving you expense and needless downtime in replacing degraded components. Our moisture filters offer unsurpassed protection against moisture contamination for your GC system.

Economical, with immediate payback

A Gas Clean Filter System allows you to use 99.996% (4.6) pure helium instead of the more expensive 99.999% (5.0) or 99.9999% (6.0) grade, while still yielding high quality analytical results. Figure 5 compares the costs of carrier gas with the use of helium 4.6 and 6.0. The expected cost savings are 30%.

The Gas Clean Filter System, in combination with 4.6 grade helium, delivers at least the same quality gas to your GC and GC/MS as using 6.0 grade helium with respect to oxygen and water. This presents considerable savings over the use of higher quality helium.

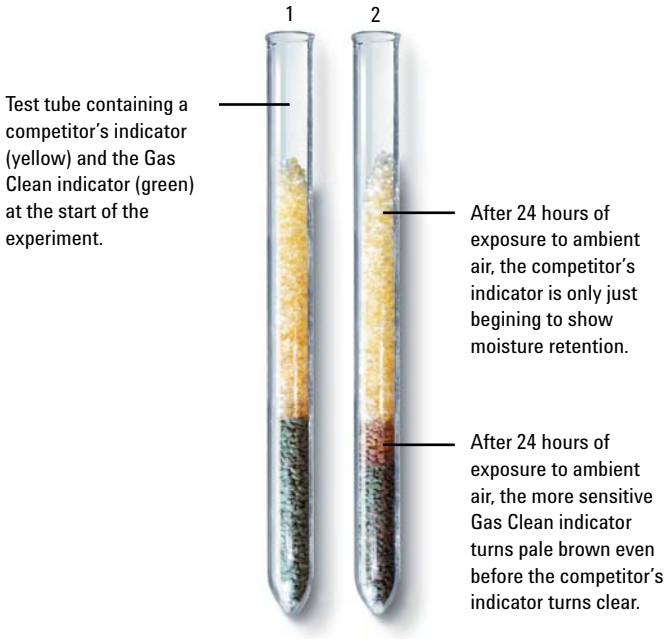

Figure 4. *Shows how Gas Clean filter indicators are extremely sensitive to moisture. After exposure, the Gas Clean indicator in tube 2 changes color before another manufacturer's indicator has barely begun to react.*

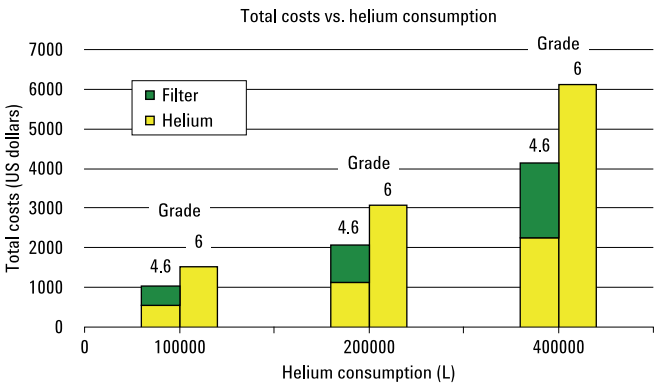

Figure 5. *Shows the cost savings in helium provided by the Gas Clean Filter System when using 4.6 grade rather than 6.0 grade helium.*

The right filter for every gas

A full range of filters

Six different filters are available. Each fast-stabilizing absorbent is packed in a transparent and virtually unbreakable, heavy-walled polycarbonate housing. Our full range offers you:

- A GC/MS Filter that delivers faster stabilization times for lower gas consumption and faster set-up time. The single filter unit with a combination of filters removes oxygen, moisture, and hydrocarbons from carrier gas for MS applications.
- A Moisture Filter that also delivers faster stabilization times for increased productivity in GC. Water removal prevents needless hydrolization damage to the stationary phase, fused silica surface, glass wool, or septum.
- An Oxygen Filter that prevents oxidation of the liquid stationary phase, septum, or glass wool in GC.
- A Process Moisture Filter, process connecting units, and male connectors, free from any brass and copper, for safe use with acetylene in process GC.
- A Charcoal Filter that removes organic compounds and ensures correct performance of FID detectors in GC.
- A new Carbon Dioxide Filter that eliminates CO_2 from supply gas. When combined with a Moisture Filter, it is ideal for zero-air gas generators.

Improvements to the absorbance materials in the GC/MS and Moisture Filters mean that they stabilize more quickly to reduce downtime and improve productivity. We have also introduced a high flow connection unit that handles flow rates up to 20 L/min for collision gas applications, supply gas for ICP and ICP-MS, or any application where high flows are required, expanding the range of applications you can run. For operations requiring flows above 10 L/min, you can save money by using cheaper gas and by eliminating contaminants. Each Gas Clean Filter is compatible with both the high flow and standard connection units.

All GC applications benefit from the use of Gas Clean Filters, whether your GC is connected to an FID or MS or to any other type of detector, such as flame photometric, thermal conductivity, electron capture, nitrogen-phosphorous, or thermoionic.

Modular design for easy mounting

The Gas Clean Filter System consists of two key parts: the connecting unit and the filters. The connecting unit has inlet and outlet connectors for the gas lines, and the system can be wall-mounted or fixed to a bench. Connecting units come with a 1, 2, or 4 filter capacity and are available for 1/4 in. or 1/8 in. gas lines.

Filter selection guide

Technique	Filters	Benefit
GC/MS	GC/MS Filter	Higher data accuracy and less maintenance
GC column	Moisture Filter and Oxygen Filter	Longer lifetime
ECD detector (GC)	Moisture Filter and Oxygen Filter	Greater sensitivity
TCD detector (GC)	Moisture Filter and Oxygen Filter	Greater sensitivity and less maintenance
Process GC	Process Moisture Filter	Long-term stability
FID detector (GC)	Two Charcoal Filters (for air and hydrogen)	Greater sensitivity
PID detector (GC)	Oxygen Filter and Charcoal Filter	Greater sensitivity
PFPD or FDP detector (GC)	Charcoal Filter, CO_2 Filter, and Moisture Filter	Greater sensitivity
TSD or NPD detector (GC)	Charcoal Filter, CO_2 Filter, and Moisture Filter	Greater sensitivity
Total organic carbon	CO_2 Filter and Moisture Filter	Greater sensitivity
Zero-air generator	CO_2 Filter and Moisture Filter	Cleaner gas
ICP-OES, ICP-MS	High Flow Connection Unit with two Oxygen Filters	Greater sensitivity

Contact your local Agilent representative for the filter sets applicable to your GC configuration.

Gas Clean Filter technical specifications

	Oxygen Filter	Moisture Filter/ Process Moisture Filter	Charcoal Filter	GC/MS Filter	CO_2 Filter
Function	Removes oxygen as well as traces of sulfur and chlorine compounds from carrier gas	Removes water, oil, and other foreign material from the carrier gas	Removes organic compounds from gas streams	Single combination filter; removes water, oxygen, and organic compounds	Removes CO_2 from gas stream; to be used in combination with Moisture Filter
Indicator color change	From green to gray	From green to pale brown	No indicator	Oxygen: from green to gray Moisture: from green to pale brown	From white to violet
Capacity	150 mL oxygen	7.2 g water	Approximately 7 g, depending on impurities	100 mL oxygen, 1 g water, organics depending on impurities	9 g CO_2
Outlet concentration at operating flow of 1-10 L/min	<50 ppb	<0.1 ppm	<0.1 ppm	Oxygen <50 ppb Moisture <0.1 ppm Organics <0.1 ppm	<1 ppm

Agilent CrossLab GC supplies

Agilent CrossLab supplies are a convenient, practical, and productive choice.

Now you can simplify your ordering process and increase your overall productivity with Agilent CrossLab supplies. Agilent's new CrossLab portfolio provides a wide array of high-quality supplies designed to fit most major brands of GC systems. CrossLab lets you consolidate purchasing and reduce your administrative burden, without sacrificing quality, reliability, or reproducibility.

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The growing Agilent CrossLab portfolio is manufactured to perform seamlessly with GCs from Bruker, Varian (now Bruker products), PerkinElmer, Shimadzu, and Thermo Scientific. CrossLab products include Agilent's innovative Ultra Inert inlet liners for active compounds, plasma-treated non-stick liner O-rings and inlet septa, autosampler syringes, autosampler vials and closures, capillary column ferrules and column nuts, and more.

New products critical to instrument performance and productivity are continuously being added to the CrossLab portfolio, so you are almost certain to find exactly what you need.

For more information, go to www.agilent.com/chem/CrossLab

Ordering information

Gas Clean Filter Kits	Part number
Agilent Gas Clean Filter kit (connecting unit for four filters, incl. four filters [1/4 in. tube*])	CP7995
Agilent Gas Clean Filter kit (connecting unit for four filters, incl. four filters [1/8 in. tube])	CP736530
Agilent Gas Clean GC/MS Filter kit (incl. one connecting unit 1/8 in. and two GC/MS Filters)	CP17976
Agilent Gas Clean GC/MS Filter kit (incl. one connecting unit 1/4 in. and two GC/MS filters)	CP17977
Agilent Gas Clean GC/MS Filter installation kit (incl. CP17976 1 m copper tubing, two nuts, and two ferrules 1/8 in.)	CP17978
Agilent Gas Clean CO_2 kit, 1/4 in. (incl. 2 position connecting unit and CO_2 and Moisture Filters)	CP17982
Agilent Gas Clean CO_2 kit, 1/8 in. (incl. 2 position connecting unit and CO_2 and Moisture Filters)	CP17983
TCD Filter kit (with Oxygen and Moisture Filters)	CP738408

Connecting unit for:	Part number
1 Filter (1/4 in. tube)	CP7980
1 Filter (1/8 in. tube)	CP7988
2 Filters (1/4 in. tube)	CP738406
2 Filters (1/8 in. tube)	CP738407
4 Filters (1/4 in. tube)	CP7989
4 Filters (1/8 in. tube)	CP736520
High flow connecting unit, 1/4 in.	CP17984
High flow connecting unit, 1/8 in.	CP17985
Agilent Gas Clean Process Moisture Filter:	
1 Filter (SS, 1/4 in. tube)	CP7980P4
1 Filter (SS, 1/8 in. tube)	CP7988P8
1 Filter (SS, 3 mm tube)	CP7988P3
1 Filter (SS, 6 mm tube)	CP7980P6

Replacement Gas Clean Filters	Part number
Agilent Gas Clean CO_2 Filter	CP17969
Agilent Gas Clean Oxygen Filter	CP17970
Agilent Gas Clean Moisture Filter	CP17971
Agilent Gas Clean Process Moisture Filter	CP17971P
Agilent Gas Clean Charcoal Filter	CP17972
Agilent Gas Clean GC/MS Filter	CP17973

Accessories and Fittings	Part number
Wall mounting bracket for connecting unit (for CP7980 and CP7988)	CP7981
Upper part filter connecting unit	CP7978
Flush head for connecting unit	CP7987
Male connector 1/4 in. with dust filter	CP7986
Male connector 1/8 in. with dust filter	CP82117
Viton O-rings (two sets)	CP7983
Male connector for Gas Clean Process Moisture Filter:	
Male connector SS 1/4 in. with dust filter	CP7986SS
Male connector SS 1/8 in. with dust filter	CP82117SS
Male connector SS 3 mm with dust filter	CP82117SS3
Male connector SS 6 mm with dust filter	CP7986SS6

* For 1/8 in. tube, use reducer 1/8 in. x 1/4 in., part. no. CP4392

A comprehensive portfolio from the leader in gas chromatography

Agilent provides the broadest selection of GC and GC/MS systems, support, and supplies in the industry. So whether you need flexible, reliable hardware and software for complex research; simple, robust systems for routine production environments; or fast, rugged portable solutions for real-time measurements in the plant or in the field, we have a GC or GC/MS to meet your analytical and business challenges.

Agilent 7890A GC System – for the next level of GC and GC/MS performance.

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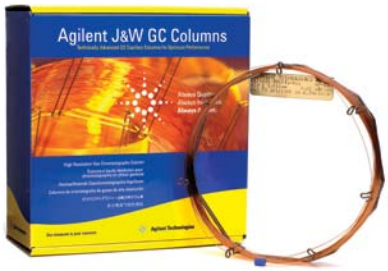

Put 40 years of Agilent quality and innovation behind your every separation. Agilent J&W GC Columns offer the lowest bleed levels, the best inertness for acids/bases/mixed functional compounds, and the tightest column-to-column reproducibility. So when you put industry-leading Agilent J&W GC Columns to work in your lab, you can have the utmost confidence in your column, and in every separation.

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