

VICI  
Analytical  
Components  
& Systems

VICI Metronics

## Gas Specific Purifiers and Contaminant Traps

- Reduce gas impurities from high PPM to low PPB levels
- Decrease baseline noise and increase GC/MS sensitivity
- Replace three traps with one purifier



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What's  
**NEW?**  
look for this  
circle



## GC Purifiers

Fit over 80 different models of Gas Chromatographs

- ◆ Agilent
- ◆ Beckman
- ◆ Bruker
- ◆ Carlo Erba
- ◆ Chrompack
- ◆ CTC Analytics
- ◆ Dani
- ◆ Dynatech
- ◆ Gilson
- ◆ Hewlett Packard
- ◆ Hitachi
- ◆ Merck
- ◆ Perkin-Elmer
- ◆ Pharmacia
- ◆ Shimadzu
- ◆ Siemens
- ◆ Spark
- ◆ Spectra-Physics
- ◆ Varian

# Gas Traps / Purifiers for GC

## CHROMTECH

We offer several types of purifiers for removal of moisture, hydrocarbon, oxygen, and other chemicals from carrier gases.

All have been proven cost effective in preventing column degradation, eliminating baseline drift and maximizing the accuracy of analytical data.

They have been designed for optimum rate and breakthrough capacity. For best overall results in contaminant removal they should be used in combination.

### Hydrocarbon/Water Gas Purifier

- Conditions eight cylinders of 99.999% purity (200 ft<sup>3</sup>/ea) to less than 1 ppm Hydrocarbon and Water.
- Pressure rating : 250 PSI
- 1/8" Brass Fittings
- Volume: 120cc Size: 1.3" OD x 11" L
- Spun Aluminum Chamber



Description	Old Varian Liner #	Qty	Part#	Price \$
Hydrocarbon/Water Gas Purifier	03-949862-00	1/pk 5/pk	394986200 394986200-5	OEM

### Oxygen Gas Purifier

- Conditions four cylinders of 99.999% purity (200 ft<sup>3</sup>/ea) to less than 1 ppm O<sub>2</sub>.
- Pressure rating : 250 PSI
- 1/8" Brass Fittings
- Volume: 120cc Size: 1.3" OD x 11" L
- Spun Aluminum Chamber



Description	Old Varian Liner #	Qty	Part#	Price \$
Oxygen Gas Purifier	03-949770-02	1/pk 5/pk	394977002 394977002-5	OEM

### Hydrocarbon/Water Gas Purifier w/ Moisture Indicator

- Moisture indicator changes color when saturated
- Removes Moisture & Hydrocarbons
- Made from Clear Lexan®
- 1/8" Brass Fitting
- Volume: 200cc Size: 2" OD x 10.25" L
- Pressure Rating: 100 PSI
- Removes: H<sub>2</sub>O, HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
Hydrocarbon/Water Gas Purifier w/ Moisture Indicator	1/pk 5/pk	30000 30000-5	OEM

# Gas Traps / Purifiers for GC

## CHROMTECH

### Pencil Filters

- Removes moisture and hydrocarbons
- Usable in small areas
- 1/8" Brass Fittings
- Aluminum chamber
- Various lengths available
- Custom materials available



Description	Qty	Part#	Price \$
Filter, 4.81 in., Clear, Flow Module (Moisture/Hydrocarbons)	1/pk	391713401	OEM
	5/pk	391713401-5	
Filter, 4.81 in., Gold, Flow Module (Hydrocarbons)	1/pk	391713402	OEM
	5/pk	391713402-5	
Filter, 2.02 in., Clear, Flow Module, Short (Hydrocarbons)	1/pk	391895901	OEM
	5/pk	391895901-5	
Filter, 1.62 in., Gold, Flow Module (Moisture/Hydrocarbons)	1/pk	391895902	OEM
	5/pk	391895902-5	

Custom products & bulk pricing available. Email or fax us with your specifications for more information.

## High Capacity Gas Purifiers

Fits over 80 different models of Gas Chromatographs

- ♦ Agilent
- ♦ Beckman
- ♦ Bruker
- ♦ Carlo Erba
- ♦ Chrompack
- ♦ CTC Analytics
- ♦ Dani
- ♦ Dynatech
- ♦ Gilson
- ♦ Hewlett Packard
- ♦ Hitachi
- ♦ Merck
- ♦ Perkin-Elmer
- ♦ Pharmacia
- ♦ Shimadzu
- ♦ Siemens
- ♦ Spark
- ♦ Spectra-Physics
- ♦ Varian

# Gas Traps / Purifiers for GC

## CHROMTECH

### Hydrocarbon Gas Purifier

- Conditions more than ten cylinders of 99.999% purity (200 ft<sup>3</sup>/ea) to less than 1 ppm Hydrocarbon
- Spherical high capacity materials
- Pressure rating : 250 PSI
- 1/8" Brass Fittings
- Volume: 120cc Size: 1.30" OD x 11.0" L
- Spun Aluminum Chamber



Description	Qty	Part#	Price \$
Hydrocarbon Gas Purifier	1/pk	30001	OEM
	5/pk	30001-5	

### H<sub>2</sub>O Gas Purifier

- Conditions more than ten cylinders of 99.999% purity (200 ft<sup>3</sup>/ea) to less than 1 ppm Water
- Spherical high capacity materials
- Pressure rating : 250 PSI
- 1/8" Brass Fittings
- Volume: 120cc Size: 1.30" OD x 11.0" L
- Spun Aluminum Chamber



Description	Qty	Part#	Price \$
100% H <sub>2</sub> O Gas Purifier	1/pk	30002	OEM
	5/pk	30002-5	

### H<sub>2</sub>O/Hydrocarbon Gas Purifier

- Conditions more than ten cylinders of 99.999% purity (200 ft<sup>3</sup>/ea) to less than 1 ppm Water and Hydrocarbon
- Spherical high capacity materials
- Pressure rating : 250 PSI
- 1/8" Brass Fittings
- Volume: 120cc Size: 1.30" OD x 11.0" L
- Spun Aluminum Chamber



Description	Qty	Part#	Price \$
H <sub>2</sub> O/Hydrocarbon Gas Purifier	1/pk	30003	OEM
	5/pk	30003-5	

### Oxygen/Hydrocarbon Gas Purifier

- Conditions six cylinders of 99.999% purity (200 ft<sup>3</sup>/ea) to less than 1 ppm O<sub>2</sub> and Hydrocarbon
- Spherical high capacity materials
- Pressure rating : 250 PSI
- 1/8" Brass Fittings
- Volume: 120cc Size: 1.30" OD x 11.0" L
- Spun Aluminum Chamber



Description	Qty	Part#	Price \$
Oxygen/Hydrocarbon Gas Purifier	1/pk	30004	OEM
	5/pk	30004-5	

# Gas Traps / Purifiers for GC

## CHROMTECH

### Oxygen/H<sub>2</sub>O Gas Purifier

- Conditions five cylinders of 99.999% purity (200 ft<sup>3</sup>/ea) to less than 1 ppm O<sub>2</sub> and H<sub>2</sub>O
- Spherical high capacity materials
- Pressure rating : 250 PSI
- 1/8" Brass Fittings
- Volume: 120cc Size: 1.30" OD x 11.0" L
- Spun Aluminum Chamber



Description	Qty	Part#	Price \$
Oxygen/H <sub>2</sub> O Gas Purifier	1/pk	30005	OEM
	5/pk	30005-5	

### Oxygen Gas Purifier

- Conditions six cylinders of 99.999% purity (200 ft<sup>3</sup>/ea) to less than 1 ppm O<sub>2</sub>
- Spherical high capacity materials
- Pressure rating : 250 PSI
- 1/8" Brass Fittings
- Volume: 120cc Size: 1.30" OD x 11.0" L
- Spun Aluminum Chamber



Description	Qty	Part#	Price \$
100% O <sub>2</sub> Gas Purifier	1/pk	30006	OEM
	5/pk	30006-5	

### Hydrocarbon/Water Gas Purifier w/ Moisture Indicator

- Moisture indicator changes color when saturated
- Removes Moisture & Hydrocarbons
- Made from Clear Lexan®
- Spherical high capacity materials
- 1/8" Brass Fitting
- Volume: 200cc Size: 2" OD x 10.25" L
- Pressure Rating: 100 PSI
- Removes: H<sub>2</sub>O, HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
Hydrocarbon/Water Gas Purifier w/ Moisture Indicator	1/pk	30007	OEM
	5/pk	30007-5	

# Gas Traps / Purifiers for GC

## CHROMTECH

### Hydrocarbon Gas Purifier

- Removes Hydrocarbons
- Made from Clear Lexan®
- Spherical high capacity materials
- 1/8" Brass Fitting
- Volume: 200cc Size: 2" OD x 10.25" L
- Pressure Rating: 100 PSI
- Removes: HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
Hydrocarbon Gas Purifier	1/pk	30008	OEM
	5/pk	30008-5	

### H<sub>2</sub>O Gas Purifier

- Removes Moisture
- Made from Clear Lexan®
- Spherical high capacity materials
- 1/8" Brass Fitting
- Volume: 200cc Size: 2" OD x 10.25" L
- Pressure Rating: 100 PSI
- Removes: H<sub>2</sub>O, HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
H <sub>2</sub> O Gas Purifier	1/pk	30009	OEM
	5/pk	30009-5	

### H<sub>2</sub>O Gas Purifier w/ Moisture Indicator

- Moisture indicator changes color when saturated
- Removes Moisture
- Made from Clear Lexan®
- Spherical high capacity materials
- 1/8" Brass Fitting
- Volume: 200cc Size: 2" OD x 10.25" L
- Pressure Rating: 100 PSI
- Removes: H<sub>2</sub>O, HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
H <sub>2</sub> O Gas Purifier w/ Moisture Indicator	1/pk	30010	OEM
	5/pk	30010-5	

# Gas Traps / Purifiers for GC

## CHROMTECH

### Hydrocarbon Large Gas Purifier

- Lexan® construction
- Removes hydrocarbons
- Spherical high capacity materials
- 1/8" Brass Fitting
- Volume: 825cc Size: 3.75" OD x 7.25" L
- Pressure Rating: 100 PSI
- Removes: HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
Hydrocarbon Large Purifier	1/pk	30011	OEM
	5/pk	30011-5	

### H<sub>2</sub>O Large Gas Purifier

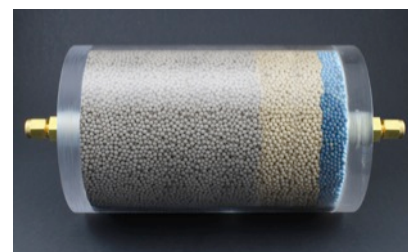
- Lexan® construction
- Removes moisture
- Spherical high capacity materials
- 1/8" Brass Fitting
- Volume: 825cc Size: 3.75" OD x 7.25" L
- Pressure Rating: 100 PSI
- Removes: H<sub>2</sub>O, HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
H <sub>2</sub> O Large Gas Purifier	1/pk	30012	OEM
	5/pk	30012-5	

### H<sub>2</sub>O Large Gas Purifier w/ Moisture Indicator

- Lexan® construction
- Removes moisture
- Moisture indicator changes color when saturated
- Spherical high capacity materials
- 1/8" Brass Fitting
- Volume: 825cc Size: 3.75" OD x 7.25" L
- Pressure Rating: 100 PSI
- Removes: H<sub>2</sub>O, HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
H <sub>2</sub> O Large Purifier w/ Moisture Indicator	1/pk	30013	OEM
	5/pk	30013-5	

# Gas Traps / Purifiers for GC

## CHROMTECH

### Moisture/Hydrocarbon Large Gas Purifier w/ Moisture Indicator

- Lexan® construction
- Removes moisture and hydrocarbons
- Moisture indicator changes color when saturated
- Spherical high capacity materials
- 1/8" Brass Fitting
- Volume: 825cc Size: 3.75" OD x 7.25" L
- Pressure Rating: 100 PSI
- Removes: H<sub>2</sub>O, HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
Moisture/Hydrocarbon Large Gas Purifier w/ Moisture Indicator	1/pk	30014	OEM
	5/pk	30014-5	

Custom products & bulk pricing available. Email or fax us with your specifications for more information.

# Specialty Gas Purifiers

# Gas Traps / Purifiers for GC

## CHROMTECH

We offer several speciality purifiers for removal of Water, Hydrogen Chloride, Sulphur Dioxide, Hydrogen Sulphide, Carbon Dioxide, Hydrocarbons, Oil, and Small Aliphatics. They have been designed for optimum rate and breakthrough capacity.

### Indicating Moisture Removal Tube w/ Bracket

- Teflon tube construction w/ aluminum ends, bracket, & Teflon tubing
- Indicating moisture material
- For small areas where moisture is a concern
- Ambient applications
- Teflon Inlet Tube - 0.085" OD
- Volume: 3.75cc Size: 0.500" OD x 3.25" L



Description	Qty	Part#	Price \$
Indicating Moisture Removal Tube w/ Bracket	1/pk	30015	OEM
	5/pk	30015-5	

### Indicating Moisture Removal Tube

- Teflon tube construction w/ aluminum ends & Teflon tubing
- Indicating moisture material
- For small areas where moisture is a concern
- Teflon Inlet Tube - 0.085" OD
- Pressure Rating: 25 PSI
- Volume: 3.75cc Size: 0.500" OD x 3.25" L



Description	Qty	Part#	Price \$
Indicating Moisture Removal Tube	1/pk	30016	OEM
	5/pk	30016-5	

### Hydrocarbon/Water Gas Purifier w/ Moisture Indicator

- Moisture indicator changes color when saturated
- Removes Moisture & Hydrocarbons
- Made from Clear Lexan®
- 1/8" Brass Fitting
- Pressure Rating: 100 PSI
- Volume: 200cc Size: 2" OD x 10.25" L
- Removes: H<sub>2</sub>O, HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
Hydrocarbon/Water Gas Purifier w/ Moisture Indicator	1/pk	30017	OEM
	5/pk	30017-5	

# Gas Traps / Purifiers for GC

## CHROMTECH

### Indicating Moisture & Hydrocarbon Removal Purifier

- Lexan® construction
- Removes moisture and hydrocarbons
- Moisture indicator changes color when saturated
- Spherical high-capacity materials
- Chrome-plated brass quick disconnect couplings to connect 1/4" tubes
- Volume: 250cc Size: 2" OD x 8.5" L
- Pressure Rating: 100 PSI
- Other Fitting options available
- Removes: H<sub>2</sub>O, HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
Indicating Moisture & Hydrocarbon Removal Purifier	1/pk	30018	OEM
	5/pk	30018-5	

### Hydrocarbon/Moisture Removal w/ Indicating Media

- Lexan® construction
- Removes moisture and hydrocarbons
- Moisture indicator changes color when saturated
- Chrome-plated brass quick disconnect couplings to connect 1/4" tubes
- Volume: 250cc Size: 2" OD x 8.5" L
- Pressure Rating: 100 PSI
- Other fitting options available
- Removes: H<sub>2</sub>O, HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
Indicating Moisture & Hydrocarbon Removal Purifier	1/pk	30019	OEM
	5/pk	30019-5	

### Hydrocarbon/Moisture Purifier

- Lexan® construction
- Removes moisture and hydrocarbons
- Moisture indicator changes color when saturated
- Nickel-plated Brass Push to connect fitting: Fits 1/4" Tubing
- Volume: 275cc Size: 2" OD x 9" L
- Pressure Rating: 100 PSI
- Other Fitting options available
- Removes: H<sub>2</sub>O, HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
Hydrocarbon/Moisture Purifier	1/pk	30020	OEM
	5/pk	30020-5	

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# Gas Traps / Purifiers for GC

## CHROMTECH

### Ultra Fine Moisture/Hydrocarbon/Indicating Purifier

- Lexan® construction
- Removes moisture and hydrocarbons
- Moisture indicator changes color when saturated
- Pre & Post Ultra Fine Balston Particulate Filters
- Removes 99.9999% of all particles over 0.1µm
- Anarak o-ring clip-lok fittings
- Square ends for mounting
- Volume: 625cc Size: 3.25" OD x 8.5" L
- Pressure Rating: 100 PSI
- Other Fitting options available
- Removes: H<sub>2</sub>O, HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
Ultra Fine Moisture/Hydrocarbon/Indicating Purifier	1/pk	30021	OEM
	5/pk	30021-5	

### Moisture/Hydrocarbon Large Purifier w/ Ultra Fine Post Particulate Filter

- Lexan® construction
- Removes moisture and hydrocarbons
- Moisture indicator changes color when saturated
- Ultra fine Balston particulate filter on outlet
- Removes 99.99% of all particles over 0.1µm
- Inlet/Outlet Teflon Tubing
- Volume: 825cc Size: 3.75" OD x 7.25" L
- Pressure Rating: 100 PSI
- Other Fitting options available
- Removes: H<sub>2</sub>O, HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
Moisture/Hydrocarbon Large Purifier w/ Ultra-Fine Post Particulate Filter	1/pk	30022	OEM
	5/pk	30022-5	

### Moisture/Hydrocarbon Jumbo Purifier w/ Ultra-Fine Post Particulate Filter

- Lexan® construction
- Removes moisture and hydrocarbons
- Moisture indicator changes color when saturated
- Ultra Fine Balston Particulate Filter on outlet
- Removes 99.99% of all particles over 0.1µm
- Inlet/Outlet Teflon Tubing
- Volume: 1650cc Size per filter: 3.75" OD x 7.25"L (Dual Filters)
- Pressure Rating: 100 PSI
- Other Fitting options available
- Removes: H<sub>2</sub>O, HCl, SO<sub>2</sub>, NO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, Oil, & Small Aliphatics



Description	Qty	Part#	Price \$
Moisture/Hydrocarbon Jumbo Purifier w/ Ultra-Fine Post Particulate Filter	1/pk	30023	OEM
	5/pk	30023-5	

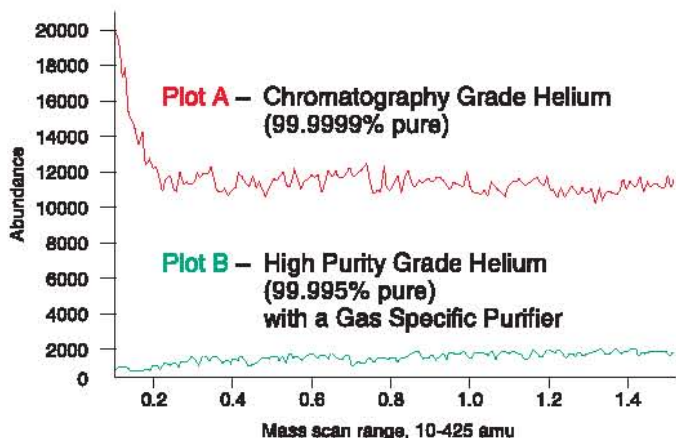
## Gas Specific Purifiers and Contaminant Traps

- Reduce gas impurities from high PPM to low PPB levels
- Decrease baseline noise and increase GC/MS sensitivity
- Replace three traps with one purifier



### Description

Several types of contaminants are detrimental to GC performance – notably moisture, hydrocarbons, and oxygen. VICI Metronics gas-specific purifier modules are designed to be placed in-line with the GC carrier or detector gas supply to remove these contaminants from the analytical gases prior to entering the GC. The modules dramatically reduce contaminant levels and absorb a greater variety of contaminants than other products.



Performance is optimized by a multiple bed format. Each bed functions at a lower contaminant concentration, resulting in a series of contaminant concentration gradients across the length of the module. Advanced materials and design features guarantee that the modules will produce gases that are at least a factor of ten higher than a 99.9999% "chromatography grade" cylinder of gas when the purifier is supplied by a 99.995% cylinder. The cost difference between the two grades of gas will pay for the cost of the purifier several times over during its operating life.

**Our successive bed format achieves the highest purity gas commercially available**

**Two very high capacity hydrocarbon and moisture sorbents at the inlet for effective contaminant removal**

**Unique proprietary broad spectrum sorbent material for multiple contaminant removal**

**Two oxygen scavenging materials for both high capacity and high efficiency O<sub>2</sub> removal**

**Multiple bed format to allow several step reduction in contaminants**

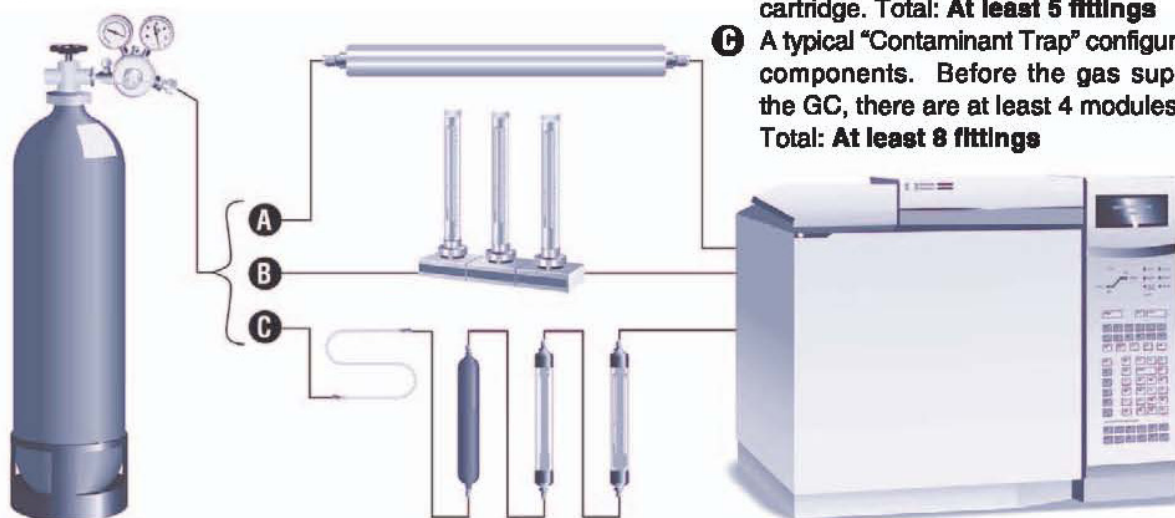
**Removal of H<sub>2</sub>O, O<sub>2</sub>, halocarbons, hydrocarbons, CO, CO<sub>2</sub>, H<sub>2</sub>, and sulfur containing compounds with a single purifier**

**Very high efficiency sorbents at the outlet for trace contaminant removal**



## Fittings: the Fewer the Better

Every connection in your gas delivery system has the potential for leaks; the more fittings you have, the greater the potential. In the illustration below, several gas purification options are depicted:



- A** The VICI Metronics Gas Specific Purifier minimizes the number of fittings. Total: **2 fittings**
- B** The "Manifold System" has two compression fittings for the system and one organic O-ring seal for each cartridge. Total: **At least 5 fittings**
- C** A typical "Contaminant Trap" configuration has several components. Before the gas supply even enters the GC, there are at least 4 modules. Total: **At least 8 fittings**

## Specifications

Length ..... 52.3 cm (21")  
 Diameter ..... 3.8 cm (1.5")  
 Maximum Inlet pressure ..... 6895 kPa (1000 psi)  
 Maximum recommended flow ..... 500 ml/min

Pressure drop, 827 kPa (120 psi) inlet,  
 at a flow of 0 to 500 ml/min ..... < 0.20 psi  
 Compression end fittings ..... 1/8" or 1/4"  
 Shipping weight ..... 1,300 g (3.04 lb)

## Selection Guide and Ordering Information

Product Description	Product no.	Fitting	PPB at outlet, based on 50 PPM nominal inlet concentration level					
			CO	CO <sub>2</sub>	O <sub>2</sub>	H <sub>2</sub> O	Sulfur compounds	NMHC*
Helium purifier	P-100-1	1/8"	<1	<1	<1	<1	<1	<3
	P-100-2	1/4"	<1	<1	<1	<1	<1	<3
Hydrogen purifier	P-200-1	1/8"	<1	<1	<1	<1	<1	<3
	P-200-2	1/4"	<1	<1	<1	<1	<1	<3
Nitrogen purifier	P-300-1	1/8"	<1	<1	<1	<1	<1	<3
	P-300-2	1/4"	<1	<1	<1	<1	<1	<3
Nitrogen purifier for LC/MS apps	P-310-1	1/8"				<25	<25	<25
	P-310-2	1/4"				<25	<25	<25
Purifier for nitrogen generators	P-350-1	1/8"				<25	<25	<25
	P-350-2	1/4"				<25	<25	<25
Air purifier	P-400-1	1/8"				<1		<3
	P-400-2	1/4"				<1		<3
Moisture trap	T-100-1	1/8"				<1		
	T-100-2	1/4"				<1		
Hydrocarbon trap	T-200-1	1/8"						<3
	T-200-2	1/4"						<3
Oxygen trap	T-300-1	1/8"			<1	<1		
	T-300-2	1/4"			<1	<1		
Sulfur trap	T-400-1	1/8"				<1	<1	
Methane purifier	P-500-1	1/8"	<1	<1	<1	<1	<1	<3

**VICI® Metronics**

**VICI AG**

**VICI AG International** \*NMHC = non-methane hydrocarbons

VICI® is a registered trademark of Valco Instruments Co. Inc. and VICI AG.

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**ECH**nology Pty Ltd

**Australian Distributors**  
 Importers & Manufacturers  
[www.chromtech.net.au](http://www.chromtech.net.au)

**1112**

rev 11/08

## GAS PURIFICATION

### Overview

#### Overview

#### Gas specific purifiers

#### Specialized purifiers

#### Contaminant traps

Gas purity is essential in any application requiring extreme sensitivity. Contaminant traps and gas purifiers for specific gases dramatically reduce the levels of contaminants, enhance the purity of lower grade helium, and help ensure instrument stability, reproducibility, and lower maintenance costs.

#### Purifiers for specific gases

Purifiers from VICI Metronics are designed to go in-line with the carrier or detector gas supply. These include models which were original equipment gas purifiers for the Agilent Mass Spec and LC Mass Spec.

Also available are VICI Valco heated helium and nitrogen purifiers, for peak purification performance.

Air  
Carbon dioxide  
Helium  
Hydrogen  
Methane  
Nitrogen



#### Specialized purifiers

We also offer purifiers for special applications, such as chemical ionization MS, and nitrogen for LC/MS or from a nitrogen generator. Our liquid carbon dioxide purification technology can result in significant cost savings.

For nitrogen for LC/MS  
For nitrogen generators  
For chemical ionization MS  
For liquid carbon dioxide  
Heated helium purifiers  
Heated nitrogen purifiers

#### Contaminant traps

For applications with a single contaminant of interest, high capacity contaminant specific traps are your best option, since they generally have four times as much capacity for the specific contaminant as a gas specific purifier.

Hydrocarbon traps  
Mercury traps  
Moisture traps  
Oxygen traps  
Sulfur traps

#### SEE ALSO

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## GAS PURIFICATION

### Gas Specific Purifiers from VICI Metronics

#### Overview

#### Gas specific purifiers

- Air
- Carbon dioxide
  - Standard
  - Heated
- Hydrogen
- Methane
- Nitrogen
  - Standard
  - Heated

#### Specialized purifiers

#### Contaminant traps

- Original equipment in Agilent® Mass Spec and LC Mass Spec
- Provide point-of-use gas purification of helium, hydrogen, methane, nitrogen, carbon dioxide, or air
- Reduce gas impurities from high PPM to low PPB levels
- Decrease baseline noise and increase GC/MS sensitivity
- Replace three traps with one purifier



Gas purification is critical to GC performance. Several types of contaminants are detrimental – notably moisture, hydrocarbons, and oxygen. VICI Metronics gas purifier modules are designed to be placed in-line with the GC carrier or detector gas supply to remove these contaminants from the analytical gases prior to their entering the GC.

Gas purification is optimized by a multiple bed format. Each bed functions at a lower contaminant concentration, resulting in a series of contaminant concentration gradients across the length of the gas purifier.

See illustration. >

VICI Metronics gas purifiers dramatically reduce contaminant levels and absorb a greater variety of contaminants than other gas purification products. Advanced materials and design features guarantee that the modules will produce gases that are at least a factor of ten higher than a 99.9999% "chromatography grade" cylinder of gas when the purifier is supplied by a 99.995% cylinder. See chart. >

The cost difference between the two grades of gas will pay for the cost of the gas purifier several times over during its operating life.

Gas	Fitting size	Product No.
Helium	1/8"	P100-1*
	1/4"	P100-2
Hydrogen	1/8"	P200-1
	1/4"	P200-2
Nitrogen	1/8"	P300-1
	1/4"	P300-2*
Air	1/8"	P400-1
	1/4"	P400-2
Methane	1/8"	P500-1
	1/4"	P500-2
Carbon dioxide	1/8"	P600-1
	1/4"	P600-2

\* Original equipment for Agilent Mass Spec and LC Mass Spec (Agilent part# 5182-3467)

\*\* Original equipment for Agilent Mass Spec and LC Mass Spec (Agilent part# G1946-80047)

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#### MORE INFORMATION

- Contact us to find out more about VICI Metronics gas purifiers. North American customers can call toll-free (877) 737-1887.
- Fittings and gas purify
- Table of PPB at outlet for six typical contaminants
- Printable data sheet

#### SPECIFICATIONS

Max inlet pressure:  
1000 psi;  
Recommended flow:  
500 mL/min

#### SAFETY NOTE

Not to be used for purification of oxygen

#### SEE ALSO

- Valco heated helium purifiers and nitrogen purifiers
- Liquid carbon dioxide purifiers
- Nitrogen purifier for LC/MS
- Purifier for nitrogen from a nitrogen generator
- Purifier for CI/MS

## GAS PURIFICATION

### Specialized Purifiers

#### Overview

#### Gas specific purifiers

#### Specialized purifiers

- For nitrogen for LC/MS
- For nitrogen generators
- For chemical ionization MS
- For liquid carbon dioxide
- Heated helium purifiers
- Heated nitrogen purifiers

#### Contaminant traps

#### For nitrogen for LC/MS

VICI Metronics nitrogen purifiers are optimized for the high flow nitrogen gas supply used on LC/MS instruments. A nitrogen purifier module placed in line with the nitrogen gas delivery system removes moisture, hydrocarbons, halocarbons, and oxygen, retaining them for the operating life of the purifier.

[Product information](#)

#### For nitrogen generators

The purifier for nitrogen generators reduces most contaminant levels from many parts per million to levels that are below the lower limit of analytical detection, and absorbs a larger number and a greater variety of contaminants than other commonly used adsorptive materials.

[Product information](#)

#### For chemical ionization MS

In response to the increase in commercial availability of instrumentation for Chemical Ionization Mass Spectroscopy, VICI Metronics has developed a purifier designed specifically for the unique demands of the field.

[Product information](#)

#### For liquid carbon dioxide

VICI Metronics has developed a CO<sub>2</sub> purification technology which can take Coleman grade CO<sub>2</sub> and produce SFC/SFE grade CO<sub>2</sub> at the point of use, resulting in significant cost savings.

[Product information](#)

#### Heated helium and nitrogen purifiers

The purification substrate in VICI Valco gas purifiers is a non-evaporable heat-activated gettering alloy. This stable alloy is contained in a welded assembly, so the purifiers can be used safely in industrial applications with minimal precautions. The miniature version of each purifier is designed to be installed in a GC's flow path immediately upstream of the injector.

[Helium purifiers](#)  
[Nitrogen purifiers](#)

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## GAS PURIFICATION

### Contaminant Traps from VICI Metronics

#### Overview

#### Gas specific purifiers

#### Specialized purifiers

#### Contaminant traps

##### - Hydrocarbons

##### - Mercury

##### - Moisture

##### - Oxygen

##### - Sulfur

- Ultra-high capacity for the contaminant of interest
- Application specific, gas independent
- Capable of higher flow rates than our gas specific purifiers

For applications with a single contaminant of interest, high capacity contaminant specific traps are your best option, since they generally have four times as much capacity for the specific contaminant as a purifier. This translates to a capacity that exceeds twelve standard type "A" tanks of gas or the equivalent of over 300,000 liters of gas at standard temperature and pressure.



#### MORE INFORMATION

- Contact us to find out more about VICI Metronics contaminant traps. North American customers can call toll-free (877) 737-1887.
- Fittings and gas purky
- Printable data sheet
- MSDS
  - T-100
  - T-200
  - T-300
  - T-400
  - T-700

Trapped contaminant	Fitting size	Length	Product No.
Hydrocarbons	1/8"	22.5"	T200-1
	1/4"	22.5"	T200-2
Mercury	1/8"	12"	T700-1
	1/4"	12"	T700-2
Moisture	1/8"	22.5"	T100-1
	1/4"	22.5"	T100-2
Oxygen	1/8"	22.5"	T300-1
	1/4"	22.5"	T300-2
Sulfur	1/8"	12"	T400-1
		22.5"	T401-1
	1/4"	12"	T400-2
		22.5"	T401-2

#### SPECIFICATIONS

Max Inlet pressure:  
1000 psi;  
Recommended flow:  
500 mL/min

## GAS PURIFICATION

### Gas Specific Purifiers from VICI Metronics

#### Overview

#### Gas specific purifiers

- Air
- Carbon dioxide
- Helium
  - Standard
  - Heated
- Hydrogen
- Methane
- Nitrogen
  - Standard
  - Heated

#### Specialized purifiers

#### Contaminant traps

- Original equipment in Agilent® Mass Spec and LC Mass Spec
- Provide point-of-use gas purification of helium, hydrogen, methane, nitrogen, carbon dioxide, or air
- Reduce gas impurities from high PPM to low PPB levels
- Decrease baseline noise and increase GC/MS sensitivity
- Replace three traps with one purifier



Gas purification is critical to GC performance. Several types of contaminants are detrimental – notably moisture, hydrocarbons, and oxygen. VICI Metronics gas purifier modules are designed to be placed in-line with the GC carrier or detector gas supply to remove these contaminants from the analytical gases prior to their entering the GC.

Gas purification is optimized by a multiple bed format. Each bed functions at a lower contaminant concentration, resulting in a series of contaminant concentration gradients across the length of the gas purifier.

See illustration. >

VICI Metronics gas purifiers dramatically reduce contaminant levels and absorb a greater variety of contaminants than other gas purification products. Advanced materials and design features guarantee that the modules will produce gases that are at least a factor of ten higher than a 99.9999% "chromatography grade" cylinder of gas when the purifier is supplied by a 99.995% cylinder. See chart. > The cost difference between the two grades of gas will pay for the cost of the gas purifier several times over during its operating life.

Gas	Fitting size	Product No.
Helium	1/8"	P100-1*
	1/4"	P100-2
Hydrogen	1/8"	P200-1
	1/4"	P200-2
Nitrogen	1/8"	P300-1
	1/4"	P300-2*
Air	1/8"	P400-1
	1/4"	P400-2
Methane	1/8"	P500-1
	1/4"	P500-2
Carbon dioxide	1/8"	P600-1
	1/4"	P600-2

\* Original equipment for Agilent Mass Spec and LC Mass Spec (Agilent part# 5182-3467)

\*\* Original equipment for Agilent Mass Spec and LC Mass Spec (Agilent part# G1946-80047)

#### MORE INFORMATION

- Contact us to find out more about VICI Metronics gas purifiers. North American customers can call toll-free (877) 737-1887.
- Fittings and gas purky
- Table of PPB at outlet for six typical contaminants
- Printable data sheet

#### SPECIFICATIONS

Max inlet pressure:  
1000 psi;  
Recommended flow:  
500 mL/min

#### SAFETY NOTE

Not to be used for purification of oxygen

#### SEE ALSO

- Valco heated helium purifiers and nitrogen purifiers
- Liquid carbon dioxide purifiers
- Nitrogen purifier for LC/MS
- Purifier for nitrogen from a nitrogen generator
- Purifier for CI/MS

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## GAS PURIFICATION

### Carbon Dioxide Gas Purifier for High Purity Applications

#### Overview

#### Gas specific purifiers

• Air

• Carbon dioxide

• Helium

Standard

Heated

• Hydrogen

• Methane

• Nitrogen

Standard

Heated

#### Specialized purifiers

#### Contaminant traps

- Outperforms carbon-based hydrocarbon traps
- Larger number and variety of contaminants removed
- Optimized for the high flows of process equipment

These modules, designed to be placed in-line with the CO<sub>2</sub> gas supply, use patented adsorptive materials to capture and retain a broad spectrum of hydrocarbons, halocarbons, and other contaminants that can be present in your CO<sub>2</sub> gas delivery system. The contaminants are retained for the operating life of the purifier, which is typically good for four tanks of CO<sub>2</sub>.

Performance is optimized by incorporating a multiple bed format so that each successive bed functions at a lower contaminant concentration. The result is a series of contaminant concentration gradients across the length of the module. See illustration. >



Fitting size	Length	Product No.
1/8"	22.5"	P600-1
1/4"	22.5"	P600-2

#### MORE INFORMATION

- **Contact us** to find out more about VICI Metronics gas purifiers. North American customers can call toll-free (877) 737-1887.
- **Fittings and gas purity**
- **Printable data sheet**

#### SPECIFICATIONS

Max inlet pressure:  
1000 psi;  
Recommended flow:  
500 mL/min

#### SEE ALSO

- **Liquid carbon dioxide purifiers**

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## GAS PURIFICATION

### Helium Purifiers

#### Overview

#### Gas specific purifiers

- Air
- Carbon dioxide
- Helium

#### Standard

#### Heated

- Hydrogen
- Methane
- Nitrogen

#### Standard

#### Heated

#### Specialized purifiers

#### Contaminant traps

#### Helium purifier modules from VICI Metronics

Purifiers from VICI Metronics are designed to go in-line with the carrier or detector gas supply. These include models which were **original equipment gas purifiers** for the Agilent Mass Spec and LC Mass Spec.

#### Product Information



#### Heated helium purifiers from VICI Valco Instruments

Also available in a compact miniature version, these **heated helium purifiers** are unsurpassed at removing nitrogen. For applications which can tolerate slightly more nitrogen, unheated **Metronics helium purifiers** offer an economical gas purification option.

#### Product Information



## GAS PURIFICATION

### Helium Purifiers from VICI Metronics

#### Overview

#### Gas specific purifiers

- Air
- Carbon dioxide
- Helium

#### Standard

#### Heated

- Hydrogen
- Methane
- Nitrogen

#### Standard

#### Heated

#### Specialized purifiers

#### Contaminant traps

- Original equipment in Agilent® Mass Spec and LC Mass Spec
- Reduce gas impurities from high PPM to low PPB levels
- Decrease baseline noise and increase GC/MS sensitivity
- Replace three traps with one purifier



Gas purification is critical to GC performance. Several types of contaminants are detrimental – notably moisture, hydrocarbons, and oxygen. VICI Metronics gas purifier modules are designed to be placed in-line with the GC carrier or detector gas supply to remove these contaminants from the analytical gases prior to their entering the GC.

Gas purification is optimized by a multiple bed format. Each bed functions at a lower contaminant concentration, resulting in a series of contaminant concentration gradients across the length of the gas purifier.

See illustration. >

VICI Metronics gas purifiers dramatically reduce contaminant levels and absorb a greater variety of contaminants than other gas purification products. Advanced materials and design features guarantee that the modules will produce gases that are at least a factor of ten higher than a 99.9999% "chromatography grade" cylinder of gas when the purifier is supplied by a 99.995% cylinder. See chart. > The cost difference between the two grades of gas will pay for the cost of the gas purifier several times over during its operating life.

Fitting size	Length	Product No.
1/8"	22.5"	P100-1*
1/4"	22.5"	P100-2

\* Original equipment for Agilent Mass Spec and LC Mass Spec (Agilent part# 5182-3467)

#### MORE INFORMATION

- Contact us to find out more about VICI Metronics gas purifiers. North American customers can call toll-free (877) 737-1887.
- Fittings and gas purify
- Table of PPB at outlet for six typical contaminants
- Printable data sheet
- MSDS

#### SPECIFICATIONS

Max inlet pressure:  
1000 psi;  
Recommended flow:  
500 mL/min

#### SEE ALSO

- Heated helium purifiers from VICI Valco Instruments

#### SAFETY NOTE

Not to be used for purification of oxygen

## GAS PURIFICATION

### Heated Helium Purifiers from VICI Valco Instruments

#### Overview

#### Gas specific purifiers

#### Specialized purifiers

- For nitrogen for LC/MS
- For nitrogen generators
- For chemical ionization MS
- For liquid carbon dioxide
- Heated helium purifiers
- Heated nitrogen purifiers

#### Contaminant traps

**Note:** These heated helium purifiers are unsurpassed at removing nitrogen. For applications which can tolerate slightly more nitrogen, unheated Metronics helium purifiers offer an economical option.

Carrier gas purity is essential in any application requiring extreme sensitivity. Impurities limit detector sensitivity and can even destroy capillary columns. The Valco helium purifier (HP2) provides "point-of-use" gas purification of helium or other noble gases, such as Ar, Ne, Kr, and Xe, to sub-ppm levels of reactive gaseous impurities.

Based on 10 ppm total inlet impurities, outlet impurities are less than 10 ppb for H<sub>2</sub>O, H<sub>2</sub>, O<sub>2</sub>, N<sub>2</sub>, NO, NH<sub>3</sub>, CO, CO<sub>2</sub>, and CH<sub>4</sub>. Other impurities removed include CF<sub>4</sub>, CCl<sub>4</sub>, SiH<sub>4</sub>, and light hydrocarbons.

The purification substrate is a non-evaporable heat-activated gettering alloy. This stable alloy is contained in a welded assembly, so the purifiers can be used safely in industrial applications with minimal precautions. When the getter is heated, the oxide film on the particle surface is eliminated, allowing helium to diffuse into the bulk of the getter particles. The purifier features a self-regulating design which maintains the getter material at the optimum temperature and eliminates the possibility of thermal runaway.

The miniature version is designed to be installed in a gas chromatograph's flow path immediately upstream of the injector. The HPM will remove any contaminants introduced by flow controllers, elastomeric tube seals, pressure regulators, crude traps, or other system components that are not completely clean and leak-tight.



Purifiers include a universal power supply.

Description	Voltage	Product No.
<b>HEATED HELIUM PURIFIERS</b>		
Standard size	110 VAC	HP2
	230 VAC	HP2-220
Miniature	110 VAC	HPM
	230 VAC	HPM-220
<b>REPLACEMENT POWER SUPPLY</b>		
For standard and miniature purifiers	110 VAC	PS24VDC-CE
	230 VAC	PS24VDC-CE-220
<b>REPLACEMENT GETTER ASSEMBLY</b>		
For standard purifier only		I-23572HP2

#### MORE INFORMATION

- Declaration of CE compliance
- User manual
- User manual for miniature version

**MAX OPERATING PRESSURE**  
1000 psig

**DISPOSING OF SPENT GETTER CARTRIDGES**  
Contact VICI to obtain a return authorization number. The packaged getter cartridge should be clearly marked "Traps for Disposal".

#### SEE ALSO

- VICI Metronics unheated helium purifier modules

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## GAS PURIFICATION

### Hydrogen Purifiers from VICI Metronics

#### Overview

#### Gas specific purifiers

- Air
- Carbon dioxide
- Helium
  - Standard
  - Heated
- Hydrogen
  - Standard
  - Heated
- Methane
- Nitrogen

#### Standard

#### Heated

#### Specialized purifiers

#### Contaminant traps

- Reduce gas impurities from high PPM to low PPB levels
- Decrease baseline noise and increase GC/MS sensitivity
- Replace three traps with one purifier

Gas purification is critical to GC performance. Several types of contaminants are detrimental – notably moisture, hydrocarbons, and oxygen. VICI Metronics gas purifier modules are designed to be placed in-line with the GC carrier or detector gas supply to remove these contaminants from the analytical gases prior to their entering the GC.

VICI Metronics gas purifiers dramatically reduce contaminant levels and absorb a greater variety of contaminants than other gas purification products. Gas purification is optimized by a multiple bed format. Each bed functions at a lower contaminant concentration, resulting in a series of contaminant concentration gradients across the length of the gas purifier.

See Illustration. >



Fitting size	Length	Product No.
1/8"	22.5"	P200-1
1/4"	22.5"	P200-2

#### MORE INFORMATION

- Contact us to find out more about VICI Metronics gas purifiers. North American customers can call toll-free (877) 737-1887.
- Fittings and gas purify
- Table of PPB at outlet for six typical contaminants
- Printable data sheet
- MSDS

#### SPECIFICATIONS

Max inlet pressure:  
1000 psi;  
Recommended flow:  
500 mL/min

#### SAFETY NOTE

Not to be used for purification of oxygen

## GAS PURIFICATION

### Methane Purifiers from VICI Metronics

#### Overview

#### Gas specific purifiers

- Air
- Carbon dioxide
- Helium
- Standard
- Heated
- Hydrogen
- Methane
- Nitrogen

#### Standard

#### Heated

#### Specialized purifiers

#### Contaminant traps

- Reduce gas impurities from high PPM to low PPB levels
- Decrease baseline noise and increase GC/MS sensitivity
- Replace three traps with one purifier

Gas purification is critical to GC performance. Several types of contaminants are detrimental – notably moisture, hydrocarbons, and oxygen. VICI Metronics gas purifier modules are designed to be placed in-line with the GC carrier or detector gas supply to remove these contaminants from the analytical gases prior to their entering the GC.

VICI Metronics gas purifiers dramatically reduce contaminant levels and absorb a greater variety of contaminants than other gas purification products. Gas purification is optimized by a multiple bed format. Each bed functions at a lower contaminant concentration, resulting in a series of contaminant concentration gradients across the length of the gas purifier.

See Illustration. >



Fitting size	Length	Product No.
1/8"	22.5"	P500-1
1/4"	22.5"	P500-2

#### MORE INFORMATION

- Contact us to find out more about VICI Metronics gas purifiers. North American customers can call toll-free (877) 737-1887.
- Fittings and gas purify
- Table of PPB at outlet for six typical contaminants
- Printable data sheet
- MSDS

#### SPECIFICATIONS

Max inlet pressure:  
1000 psi;  
Recommended flow:  
500 mL/min

#### SAFETY NOTE

Not to be used for purification of oxygen

#### SEE ALSO

- Purifier for CI/MS

## GAS PURIFICATION

### Nitrogen Purifiers

#### Overview

#### Gas specific purifiers

- Air
- Carbon dioxide
- Helium
- Standard
- Heated
- Hydrogen
- Methane
- Nitrogen

#### Standard

#### Heated

#### Specialized purifiers

#### Contaminant traps

#### Nitrogen purifier modules from VICI Metronics

Purifiers from VICI Metronics are designed to go in-line with the carrier or detector gas supply. These include models which were **original equipment gas purifiers** for the Agilent Mass Spec and LC Mass Spec.

#### Product Information



#### Heated nitrogen purifiers from VICI Valco Instruments

Also available in a compact miniature version, these **heated nitrogen purifiers** are the only ones which remove methane. For applications which can tolerate methane, unheated **Metronics nitrogen purifiers** offer an economical gas purification option.



#### Product Information

## GAS PURIFICATION

### Nitrogen Purifiers from VICI Metronics

#### Overview

#### Gas specific purifiers

- Air
- Carbon dioxide
- Helium
- Hydrogen
- Methane
- Nitrogen

#### Standard

#### Heated

#### Specialized purifiers

#### Contaminant traps

- Original equipment in Agilent® Mass Spec and LC Mass Spec
- Reduce gas impurities from high PPM to low PPB levels
- Decrease baseline noise and increase GC/MS sensitivity
- Replace three traps with one purifier

Gas purification is critical to GC performance. Several types of contaminants are detrimental – notably moisture, hydrocarbons, and oxygen. VICI Metronics gas purifier modules are designed to be placed in-line with the GC carrier or detector gas supply to remove these contaminants from the analytical gases prior to their entering the GC.

VICI Metronics gas purifiers dramatically reduce contaminant levels and absorb a greater variety of contaminants than other gas purification products. Gas purification is optimized by a multiple bed format. Each bed functions at a lower contaminant concentration, resulting in a series of contaminant concentration gradients across the length of the gas purifier.

See illustration. >

Fitting size	Length	Product No.
1/8"	22.5"	P300-1
1/4"	22.5"	P300-2*

\* Original equipment for Agilent Mass Spec and LC Mass Spec (Agilent part# G1946-80047)



#### MORE INFORMATION

- Contact us to find out more about VICI Metronics gas purifiers. North American customers can call toll-free (877) 737-1887.
- Fittings and gas purky
- Table of PPB at outlet for six typical contaminants
- Printable data sheet
- MSDS

#### SPECIFICATIONS

Max inlet pressure:  
1000 psi;  
Recommended flow:  
500 mL/min

#### SAFETY NOTE

Not to be used for purification of oxygen

#### SEE ALSO

- Valco heated nitrogen purifiers
- Nitrogen purifier for LC/MS
- Purifier for nitrogen from a nitrogen generator

## GAS PURIFICATION

### Heated Nitrogen Purifiers from VICI Valco Instruments

#### Overview

#### Gas specific purifiers

#### Specialized purifiers

- For nitrogen for LC/MS
- For nitrogen generators
- For chemical ionization MS
- For liquid carbon dioxide
- Heated helium purifiers
- Heated nitrogen purifiers

#### Contaminant traps

**Note:** These heated nitrogen purifiers are the only ones which remove methane. For applications which can tolerate methane, unheated Metronics nitrogen purifiers offer an economical option.

Carrier gas purity is essential in any application requiring extreme sensitivity. Impurities limit detector sensitivity and can even destroy capillary columns. The Valco nitrogen purifier provides "point-of-use" purification to sub-ppm levels of reactive gaseous impurities.

Based on 10 ppm total inlet impurities, outlet impurities are less than 10 ppb for H<sub>2</sub>O, H<sub>2</sub>, O<sub>2</sub>, NO, NH<sub>3</sub>, CO, CO<sub>2</sub>, and CH<sub>4</sub>. Other impurities removed include CF<sub>4</sub>, CCl<sub>4</sub>, SiH<sub>4</sub>, and light hydrocarbons. He, Ne, Ar, Kr, Xe, and Rn are not removed.

The purification substrate is a non-evaporable heat-activated gettering alloy. This stable alloy is contained in a welded assembly, so the purifiers can be used safely in industrial applications with minimal precautions. When the getter is heated, the oxide film on the particle surface is eliminated, allowing nitrogen to diffuse into the bulk of the getter particles. The purifier features a self-regulating design which maintains the getter material at the optimum temperature and eliminates the possibility of thermal runaway.

The miniature version is designed to be installed in a gas chromatograph's flow path immediately upstream of the injector. The NPM will remove any contaminants introduced by flow controllers, elastomeric tube seals, pressure regulators, crude traps, or other system components that are not completely clean and leak-tight.



Purifiers include a universal power supply.

Description	Voltage	Product No.
<b>HEATED NITROGEN PURIFIERS</b>		
Standard size	110 VAC	NP2
	230 VAC	NP2-220
Miniature	110 VAC	NPM
	230 VAC	NPM-220
<b>REPLACEMENT POWER SUPPLY</b>		
For standard and miniature purifiers	110 VAC	PS24VDC-CE
	230 VAC	PS24VDC-CE-220
<b>REPLACEMENT GETTER ASSEMBLY</b>		
For standard purifier only		I-23572NP2

#### MORE INFORMATION

- Declaration of CE compliance
- User manual
- User manual for miniature version

**MAX OPERATING PRESSURE**  
1000 psig

**DISPOSING OF SPENT GETTER CARTRIDGES**  
Contact VICI to obtain a return authorization number. The packaged getter cartridge should be clearly marked "Traps for Disposal".

#### SEE ALSO

- VICI Metronics unheated nitrogen purifier modules

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## GAS PURIFICATION

### Specialized Purifiers

#### Overview

#### Gas specific purifiers

#### Specialized purifiers

- For nitrogen for LC/MS
- For nitrogen generators
- For chemical ionization MS
- For liquid carbon dioxide
- Heated helium purifiers
- Heated nitrogen purifiers

#### Contaminant traps

#### For nitrogen for LC/MS

VICI Metronics nitrogen purifiers are optimized for the high flow nitrogen gas supply used on LC/MS instruments. A nitrogen purifier module placed in line with the nitrogen gas delivery system removes moisture, hydrocarbons, halocarbons, and oxygen, retaining them for the operating life of the purifier.

[Product information](#)

#### For nitrogen generators

The purifier for nitrogen generators reduces most contaminant levels from many parts per million to levels that are below the lower limit of analytical detection, and absorbs a larger number and a greater variety of contaminants than other commonly used adsorptive materials.

[Product information](#)

#### For chemical ionization MS

In response to the increase in commercial availability of instrumentation for Chemical Ionization Mass Spectroscopy, VICI Metronics has developed a purifier designed specifically for the unique demands of the field.

[Product information](#)

#### For liquid carbon dioxide

VICI Metronics has developed a CO<sub>2</sub> purification technology which can take Coleman grade CO<sub>2</sub> and produce SFC/SFE grade CO<sub>2</sub> at the point of use, resulting in significant cost savings.

[Product information](#)

#### Heated helium and nitrogen purifiers

The purification substrate in VICI Valco gas purifiers is a non-evaporable heat-activated gettering alloy. This stable alloy is contained in a welded assembly, so the purifiers can be used safely in industrial applications with minimal precautions. The miniature version of each purifier is designed to be installed in a GC's flow path immediately upstream of the injector.

[Helium purifiers](#)  
[Nitrogen purifiers](#)

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## GAS PURIFICATION

### Nitrogen Purifier for LC/MS Applications from VICI Metronics

#### Overview

#### Gas specific purifiers

#### Specialized purifiers

• For nitrogen for LC/MS

• For nitrogen generators

• For chemical ionization MS

• For liquid carbon dioxide

• Heated helium purifiers

• Heated nitrogen purifiers

#### Contaminant traps

- Designed to purify nitrogen gas produced from liquid nitrogen
- Decrease baseline noise and increase GC/MS sensitivity
- Reduce background noise and ghost peaks

VICI Metronics nitrogen purifiers are optimized for the high flow nitrogen gas supply used on LC/MS instruments. Several types of contaminants are detrimental to LC/MS performance – notably moisture, hydrocarbons, and halocarbons. A Metronics nitrogen purifier module placed in line with the nitrogen gas delivery system removes these contaminants, retaining them for the operating life of the purifier.

The purifier reduces most contaminant levels from many parts per million to levels that are below the lower limit of analytical detection, and absorbs a larger number and a greater variety of contaminants than other commonly used adsorptive materials. In particular, the Metronics nitrogen purifier has been shown to outperform the carbon-based hydrocarbon traps previously used for this application.

Fitting size	Length	Product No.
1/8"	22.5"	P310-1
1/4"	22.5"	P310-2



#### MORE INFORMATION

- **Contact us** to find out more about VICI Metronics gas purifiers. North American customers can call toll-free (877) 737-1887.
- **Fittings and gas purky**
- **Printable data sheet**
- **MSDS**

#### SPECIFICATIONS

Max inlet pressure:  
1000 psi;  
Max flow:  
12 L/min

#### SAFETY NOTE

This purifier is designed to be used with nitrogen gas produced from liquid nitrogen, or with nitrogen gas containing less than 500 ppm of oxygen. If this product is used on a stream with a high oxygen content, it may get hot enough to cause injury. Use our Purifier for Nitrogen Generators to purify high oxygen content nitrogen.

## GAS PURIFICATION

### Purifier for Nitrogen Produced by Nitrogen Generators

#### Overview

#### Gas specific purifiers

#### Specialized purifiers

• For nitrogen for LC/MS

• For nitrogen generators

• For chemical ionization MS

• For liquid carbon dioxide

• Heated helium purifiers

• Heated nitrogen purifiers

#### Contaminant traps

- Specifically designed to purify nitrogen produced from nitrogen generators
- Decrease baseline noise and increase GC/MS sensitivity
- Reduce background noise and ghost peaks

VICI Metronics nitrogen purifiers are optimized for the high flow nitrogen gas supply used on LC/MS instruments. Several types of contaminants are detrimental to LC/MS performance – notably moisture, hydrocarbons, and halocarbons. A Metronics nitrogen purifier module placed in line with the nitrogen gas delivery system removes these contaminants, retaining them for the operating life of the purifier.

The purifier reduces most contaminant levels from many parts per million to levels that are below the lower limit of analytical detection, and absorbs a larger number and a greater variety of contaminants than other commonly used adsorptive materials. In particular, the Metronics nitrogen purifier has been shown to outperform the carbon-based hydrocarbon traps previously used for this application.



Fitting size	Length	Product No.
1/8"	22.5"	P350-1
1/4"	22.5"	P350-2

#### MORE INFORMATION

- **Contact us** to find out more about VICI Metronics gas purifiers. North American customers can call toll-free (877) 737-1887.
- **Fittings and gas purify**
- **Printable data sheet**
- **MSDS**

#### SPECIFICATIONS

Max inlet pressure:  
1000 psi; Max flow:  
12L/min

## GAS PURIFICATION

### Purifier for CI/MS Applications from VICI Metronics

#### Overview

#### Gas specific purifiers

#### Specialized purifiers

- For nitrogen for LC/MS
- For nitrogen generators
- For chemical ionization MS
- For liquid carbon dioxide
- Heated helium purifiers
- Heated nitrogen purifiers

#### Contaminant traps

- 1/8" compression fittings
- 1000 psig pressure rating
- Compatible with most CI gases
- Welded stainless steel body

The use of Chemical Ionization Mass Spectroscopy has increased in recent years, with instrumentation to perform this sensitive analytical technique now available commercially. In response to this growth, VICI Metronics has developed a gas purifier designed specifically for the unique demands of chemical ionization.

Several types of contaminants are detrimental to CI performance – notably moisture, heavy hydrocarbons, halocarbons, and oxygen. A Metronics CI purifier module placed in line with the gas delivery system removes these contaminants, reducing levels from many parts per million to levels that are below the lower limit of analytical detection, and retains them for the operating life of the purifier. (Recommended replacement is after three bottles of gas, or if detector baseline drift and noise become apparent.)

A very high capacity has been engineered into the gas purifier by using several different materials for gross contaminant removal and additional materials for the removal of trace amounts of the contaminants. Three separate adsorption chemistries are incorporated into the operating design of the gas purifier to ensure the optimal capacity and efficiency. This successive bed format insures high capacity as well as a very high efficiency for the removal of contaminants that can be present in even high purity methane.

See illustration. >



#### MORE INFORMATION

- Contact us to find out more about VICI Metronics gas purifiers. North American customers can call toll-free (877) 737-1887.
- Fittings and gas purifier
- Printable data sheet

#### SPECIFICATIONS

Max inlet pressure:  
1000 psi;  
Max recommended flow:  
500 mL/min

Fitting size	Length	Product No.
1/8"	22.5"	P500-1

## GAS PURIFICATION

### Liquid Carbon Dioxide Purifier from VICI Metronics

#### Overview

#### Gas specific purifiers

#### Specialized purifiers

- For nitrogen for LC/MS
- For nitrogen generators
- For chemical ionization MS
- For liquid carbon dioxide
- Heated helium purifiers
- Heated nitrogen purifiers

#### Contaminant traps

- Produce SFC/SFE grade CO<sub>2</sub> from Coleman grade CO<sub>2</sub>
- Remove oxygen, moisture, sulfur compounds, halocarbons, and most hydrocarbons

In applications such as environmental testing, food analysis, and pigment analysis, the unique solvating properties of CO<sub>2</sub> at its triple point (super-critical stage) are exploited in the extraction of compounds from difficult matrices. Since any contaminants that may be present in the CO<sub>2</sub> will be concentrated in the sample, only ultra-pure CO<sub>2</sub> is acceptable for this type of work.

VICI Metronics has developed a new CO<sub>2</sub> purification technology (patent pending) which can take Coleman grade CO<sub>2</sub> and produce SFC/SFE grade CO<sub>2</sub> at the point of use, resulting in significant cost savings. Removal of oxygen, moisture, sulfur compounds, halocarbons, and most hydrocarbons are all accomplished with this unified CO<sub>2</sub> purification technology.

Fitting size	Length	Product No.
1/8"	22.5"	P700-1
1/4"	22.5"	P700-2

#### MORE INFORMATION

- **Contact us** to find out more about VICI Metronics gas purifiers. North American customers can call toll-free (877) 737-1887.
- **MSDS**

#### SEE ALSO

- Carbon dioxide gas purifiers

Top ▲

## GAS PURIFICATION

### Contaminant Traps from VICI Metronics

#### Overview

#### Gas specific purifiers

#### Specialized purifiers

#### Contaminant traps

##### - Hydrocarbons

##### - Mercury

##### - Moisture

##### - Oxygen

##### - Sulfur

- Ultra-high capacity for the contaminant of interest
- Application specific, gas independent
- Capable of higher flow rates than our gas specific purifiers

For applications with a single contaminant of interest, high capacity contaminant specific traps are your best option, since they generally have four times as much capacity for the specific contaminant as a purifier. This translates to a capacity that exceeds twelve standard type "A" tanks of gas or the equivalent of over 300,000 liters of gas at standard temperature and pressure.



Trapped contaminant	Fitting size	Length	Product No.
Hydrocarbons	1/8"	22.5"	T200-1
	1/4"	22.5"	T200-2
Mercury	1/8"	12"	T700-1
	1/4"	12"	T700-2
Moisture	1/8"	22.5"	T100-1
	1/4"	22.5"	T100-2
Oxygen	1/8"	22.5"	T300-1
	1/4"	22.5"	T300-2
Sulfur	1/8"	12"	T400-1
		22.5"	T401-1
	1/4"	12"	T400-2
		22.5"	T401-2

#### MORE INFORMATION

- Contact us to find out more about VICI Metronics contaminant traps. North American customers can call toll-free (877) 737-1887.
- Fittings and gas purky
- Printable data sheet
- MSDS
  - T-100
  - T-200
  - T-300
  - T-400
  - T-700

#### SPECIFICATIONS

Max Inlet pressure:  
1000 psi;  
Recommended flow:  
500 mL/min

## GAS PURIFICATION

### Hydrocarbon Traps from VICI Metronics

#### Overview

#### Gas specific purifiers

#### Specialized purifiers

#### Contaminant traps

- Hydrocarbons
- Mercury
- Moisture
- Oxygen
- Sulfur

- Removes non-methane hydrocarbons from any non-reactive gas
- Also removes halocarbons

The proprietary sorbent materials used in our high capacity hydrocarbon trap far out-perform the standard materials used for this application. The sorbent is extremely hydrophobic, so no capacity is lost in a moist gas stream. Studies have shown that this material is the most efficient and has the highest capacity for non-methane hydrocarbons of any sorbent material commercially available.



Fitting size	Length	Product No.
1/8"	22.5"	T200-1
1/4"	22.5"	T200-2

#### MORE INFORMATION

- **Contact us** to find out more about VICI Metronics contaminant traps. North American customers can call toll-free (877) 737-1887.
- **Fittings and gas purify**
- **Printable data sheet**
- **MSDS**

#### SPECIFICATIONS

Max inlet pressure:  
1000 psi;  
Recommended flow:  
500 mL/min

## GAS PURIFICATION

### Fittings and Gas Purity

#### Overview

#### Gas specific purifiers

- Air
- Carbon dioxide
- Helium
- Hydrogen
- Methane
- Nitrogen

#### Specialized purifiers

#### Contaminant traps

Basically, the point to remember is "the fewer the better". Every connection in your gas delivery system has the potential for leaks; the more fittings you have, the greater the potential. In the illustration below, several gas purification options are depicted:

- A. The Metronics gas specific purifier minimizes the number of fittings. Total fittings: 2
- B. The "Manifold System" has two compression fittings for the system and one organic O-ring seal for each cartridge. Total fittings: at least 5
- C. A typical "Contaminant Trap" configuration has several components. Before the gas supply even enters the GC there are at least 4 modules. Total fittings: at least 8



#### MORE INFORMATION

- Contact Metronics to find out more about VICI Metronics gas purifiers. North American customers can call toll-free (877) 737-1887.

# GC ACCESSORIES

## GAS PURIFICATION ESSENTIALS

Gas Purification Solutions .....	295
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What's  
**NEW?**  
look for this  
circle



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**ECH**nology Pty Ltd

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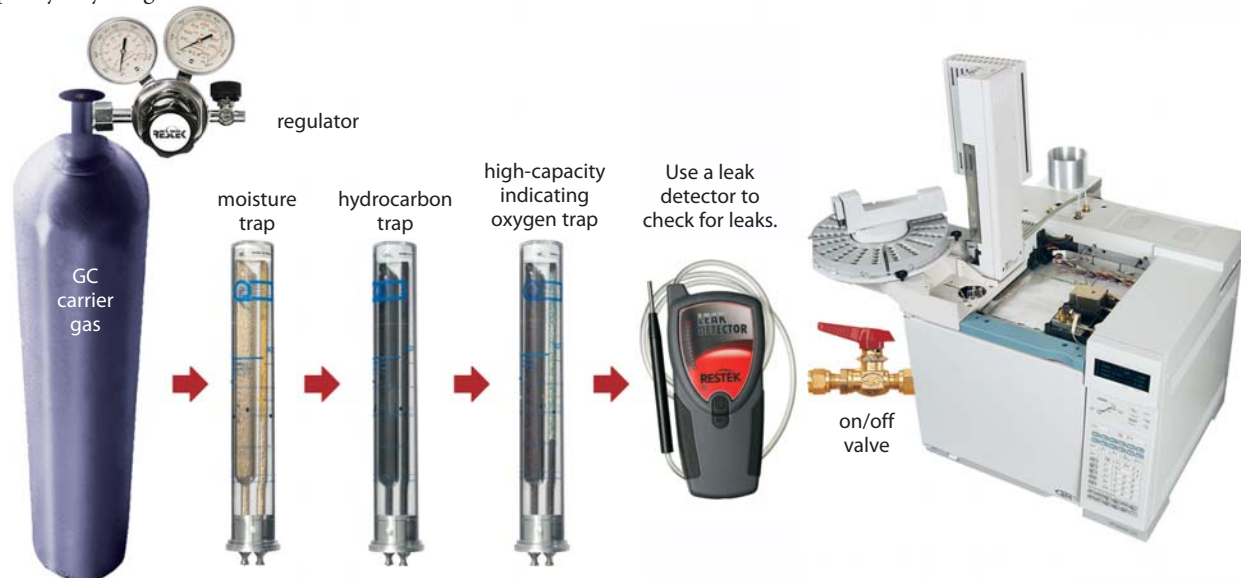
Australian Distributors  
Importers & Manufacturers  
[www.chromtech.net.au](http://www.chromtech.net.au)

11/12

**Restek provides the following total gas system solution:**

- Restek gas purifiers provide cost-effective gas purity assurance.
- Restek stainless steel and copper tubing, precleaned and ready to use.
- Swagelok® and Parker A-Lok® tube fittings consistently deliver high-quality performance.
- Extensive line of hand tools to make your work easier and faster, including Restek's Electronic Leak Detector.
- Gas generators for an uninterrupted supply of gas.
- Gas regulators for optimum line pressure control of all your chromatography gases.

Restek's Technical Service Team (800-356-1688, ext. 4 or support@restek.com) or your Restek representative can answer your questions and provide system-design advice. From the gas source to your point of use, we offer the products and services that ensure the purity of your gas.



**Why do I need to use traps and where should I install them?**

Carrier gas must contain less than 1 ppm of oxygen, water vapor, or any other trace contaminant, to prevent column degradation, shortened column lifetime, and increased stationary phase bleed. Contaminants cause ghost peaks to appear during temperature programming and degrade the validity of analytical data. The expense of using high-purity gases in combination with carrier gas purifiers will be offset by longer column lifetime and less instrument maintenance.

**Moisture Removal**

Moisture in carrier gas lines will prematurely degrade oxygen and hydrocarbon traps and increase detector noise (particularly with ECDs). As a precaution, we highly recommend installing a moisture trap before the hydrocarbon and oxygen traps on all carrier gas lines. Our favorite trap is the Super-Clean Ultra-High Capacity Moisture Filter (cat.# 22028, pg. 299).

**Hydrocarbon Removal**

Use a hydrocarbon trap if your gas has a potential source of hydrocarbon contaminants (e.g., an oil pump in an air compressor) or if you suspect you are observing carrier gas ghost peaks. Install the hydrocarbon trap after the moisture trap, to prevent moisture from degrading the hydrocarbon-trapping ability of the activated carbon in the hydrocarbon trap. We recommend the Super-Clean Ultra-High Capacity Hydrocarbon Filter (cat.# 22030, pg. 299).

**Oxygen Removal**

Oxygen is a column killer and can enter the system at any connection which is leaking. It is present even in ultra high purity gases, as minute leaks at fittings allow oxygen to influx against the concentration gradient. There are many choices for oxygen removal—the Super-Clean Ultra-High Capacity Oxygen Filter (cat.# 22029, pg. 299) is popular with Restek chemists. Because oxygen can enter a gas line at any fitting, the oxygen trap should be the last connection before the gas line enters the chromatograph.

**Leak Checking**

To prevent column degradation, increase column lifetime, and decrease stationary phase bleed, carrier gas should always contain <1 ppm oxygen. This can be monitored by continually leak checking all gas system connections using Restek's Electronic Leak Detector (cat.# 22839, page 296).

for **more info**

**Questions about which carrier gas purifier to use?**

Call 800-356-1688 or 814-353-1300, ext. 4, or contact your Restek representative to discuss your application with our technical service chemists.



www.restek.com **295**

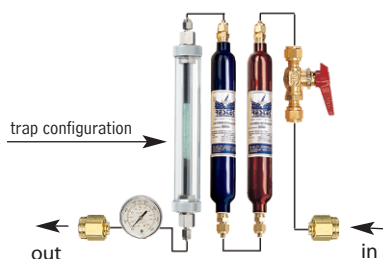


Dimensions:  
 12" x 14" x 3"  
 (30.5 x 35.6 x 7.6 cm)

### Restek Gas Management System

- Removes moisture, hydrocarbons, and oxygen from carrier gas, extending column lifetime.
- Produces high-purity carrier gas for most applications.
- Includes one each: moisture, hydrocarbon, and indicating oxygen trap.
- Replacing traps is safe and easy.
- Maximum flow: 1 liter/minute.

Restek has put together a convenient unit providing gas purification all in one step. Complete with an indicating trap, your gas purification issues are handled in one central location.



### did you know?

The Restek Gas Management System removes water vapor (to 10 ppb), hydrocarbons (to 0.1 ppm), and oxygen (to less than 0.1 ppm) with three traps housed in one unit.

Description	Fittings	qty.	cat.#	price
Restek Gas Management System	includes fittings for 1/8" and 1/4" gas line	kit	21999	
Replacement Traps		qty.	cat.#	price
High-Capacity Moisture Trap	1/8" Nickel-Plated Brass	ea.	21997	
Capillary-Grade Hydrocarbon Trap	1/8" Nickel-Plated Brass	ea.	21991	
Indicating Oxygen Trap	1/8" Nickel-Plated Brass	ea.	22010	

### Restek Electronic Leak Detector

Don't let a small leak turn into a costly repair—protect your instrument and analytical column by using a Restek Leak Detector.

Backed by a 1-year warranty, the new Restek Leak Detector sets an industry standard for performance and affordability in hand-held leak detectors.



22839



#### Leak Detector Facts

Detectable gases:	helium, nitrogen, argon, carbon dioxide, hydrogen
Battery:	Rechargeable Ni-MH internal battery pack (6 hours normal operation)
Operating Temperature Range:	32°-120°F (0°-48°C)
Humidity Range:	0-97%
Warranty:	one year
Certifications:	CE, Ex, Japan
Compliance:	WEEE, RoHS

Description	qty.	cat.#	price
Leak Detector with Hard-Sided Carrying Case and Universal Charger Set (US, UK, European, Australian)	ea.	22839	
Leak Detector Routine Maintenance Review**	ea.	22839-R	
Soft-Side Storage Case	ea.	22657	
Small Probe Adaptor	ea.	22658	

\*Caution: The Restek Electronic Leak Detector is designed to detect trace amounts of hydrogen in a noncombustible environment. It is NOT designed for determining leaks in a combustible environment. A combustible gas detector should be used for determining combustible gas leaks under any condition. The Restek Electronic Leak Detector may be used for determining trace amounts of hydrogen in a GC environment only.

\*\*Routine maintenance includes inspection of the probe tip, internal/external tubing and a battery replacement.



22658

### **i** tech tip

Avoid using liquid leak detectors on a GC! Liquids can be drawn into the system.

### for more info

See **page 273** for more information on the Restek Electronic Leak Detector.



Dimensions: 9 1/4" x 2" (23.5 x 5.1 cm)



22081

### High-Capacity Indicating Oxygen Trap

- Indicator changes from dark blue to black as oxygen & water are trapped.
- Lasts longer than three smaller traps.
- Use with all carrier gases.
- Ambient operating temperature, 100 psi (689 kPa) operating pressure.
- Built-in frit traps microparticles.
- Outlet gas purity:
  - $O_2 < 0.1$  ppm when inlet does not exceed 15 ppm.
  - $H_2O < 0.5$  ppm when inlet does not exceed 10 ppm.
- Maximum operating pressure: 150 psi (1,034 kPa).
- Maximum flow: 16.5 L/min.

Description	Fittings	qty.	cat.#	price
High-Capacity Indicating Oxygen Trap	1/8" Compression Tube Brass	ea.	20624	
High-Capacity Indicating Oxygen Trap	1/4" Compression Tube Brass	ea.	20623	
Replacement Cartridge (fits 1/4" or 1/8" housing)		ea.	20625	
Replacement O-Rings (5 small O-rings and 5 large O-rings)		kit	22081	



Dimensions: 10" x 1 1/4" (25.4 x 3.2 cm)

### Indicating Oxygen Trap

- Indicator changes from light green to grey as oxygen is trapped.
- Heavy-walled glass body, protected by polycarbonate sleeve, prevents oxygen & water infusion.
- Prepurged for fast stabilization.
- 100 psi (689 kPa) maximum operating pressure.
- Reduces oxygen to 0.1 ppm.
- 10  $\mu$ m frits at inlet and outlet.

Description	Fittings	qty.	cat.#	price
Indicating Oxygen Trap	1/8" Brass	ea.	22010	
Indicating Oxygen Trap	1/4" Brass	ea.	22011	



Dimensions: 11" x 1 1/2" (27.9 x 3.8 cm)

### High-Capacity Oxygen Trap

- Removes up to 600 mg of oxygen or 2 g of water.
- Long life—typically purifies more than five 200 ft<sup>3</sup> cylinders.
- Reduces oxygen to 15 ppb.
- Maximum operating pressure: 250 psi (1,724 kPa).
- Flow: 3 L/min. @ 32 psi (221 kPa).

Description	Fittings	qty.	cat.#	price
High-Capacity Oxygen Trap	1/8" Nickel-Plated Brass	ea.	20601	
High-Capacity Oxygen Trap	1/4" Nickel-Plated Brass	ea.	20600	

### Rechargeable Molecular Sieve S-Trap

- Traps water vapor; increases column and oxygen trap lifetime.
- Reduces baseline noise from sensitive detectors such as ECDs and mass spectrometers.
- Activated and ready to use.
- Reduces water to less than 1 ppm.
- Fits in GC oven for easy thermal recharging.
- Maximum flow: 1 L/min.



Dimensions:  
6 3/4" x 5 5/8" (17.1 x 14.3 cm)

Description	Fittings	qty.	cat.#	price
Rechargeable Molecular Sieve S-Trap	1/8" Brass	ea.	20686	
Rechargeable Molecular Sieve S-Trap	1/4" Brass	ea.	20685	



Dimensions: 11" x 1 1/2" (27.9 x 3.8 cm)

### High-Capacity Moisture Trap

- Purged with ultra-high-purity helium; ready to use.
- Reduces water to less than 15 ppb.
- Maximum operating pressure: 250 psi (1,724 kPa).
- Maximum flow: 1.25 L/min.

Description	Fittings	qty.	cat.#	price
High-Capacity Moisture Trap	1/8" Nickel-Plated Brass	ea.	21997	
High-Capacity Moisture Trap	1/4" Nickel-Plated Brass	ea.	20638	



Dimensions: 13" x 2" (33 x 5.1 cm)

### Indicating Moisture Trap

- Reduces water to less than 10 ppb; indicator changes from orange to green at 5% relative humidity.
- Prepurged for fast stabilization.
- Reduces noise from high-sensitivity detectors.
- Heavy-walled glass body prevents oxygen & water infusion.
- 10  $\mu$ m frit prevents microparticulate damage to needle valves and flow controllers.
- Maximum operating pressure: 100 psi (689 kPa).

Description	Fittings	qty.	cat.#	price
Indicating Moisture Trap	1/8" Brass	ea.	22014	
Indicating Moisture Trap	1/4" Brass	ea.	22015	

## Gas Traps



Dimensions: 11" x 1 1/2" (27.9 x 3.8 cm)

**Capillary-Grade Hydrocarbon Trap**

- Packed with an extremely high surface area, baked coconut shell-based activated carbon.
- Purged with ultra-high purity helium.
- Reduces organics to 0.1 ppm (assuming 100 ppm input).
- Maximum operating pressure: 250 psi (1,724 kPa).

Description	Fittings	qty.	cat.#	price
Capillary-Grade Hydrocarbon Trap	1/8" Nickel-Plated Brass	ea.	21991	
Capillary-Grade Hydrocarbon Trap	1/4" Nickel-Plated Brass	ea.	21992	



Dimensions: 9 1/4" x 2 1/4" (23.5 x 5.7 cm)

**Refillable Hydrocarbon Trap**

- Removes trace impurities from carrier gas.
- Reduces organics to 0.1 ppm (assuming 100 ppm input).
- 60 µm frit prevents gas contamination by purifier particles.
- Good for purge & trap systems.
- Refillable and rechargeable.
- Maximum operating pressure: 125 psig (862 kPa).
- Maximum flow: 5 L/min.

Description	Fittings	qty.	cat.#	price
Refillable Hydrocarbon Trap	1/8" Nickel-Plated Brass	ea.	22012	
Refillable Hydrocarbon Trap	1/4" Nickel-Plated Brass	ea.	22013	
Carbon Refill (two recharges)		pint	20626	

**Hydrocarbon S-Trap**

- Removes hydrocarbons and other contaminants.
- Reduces organics to 0.1 ppm (assuming 100 ppm input).
- Each individually activated to ensure maximum efficiency.
- Fits in GC oven for easy thermal recharging.
- Maximum operating pressure: 60 psi (414 kPa).



Dimensions: 6 3/4" x 5 5/8" (17.1 x 14.3 cm)

Description	Fittings	qty.	cat.#	price
Hydrocarbon S-Trap	1/8" Brass	ea.	22016	



Dimensions: 6" x 1 3/4" (15.2 x 4.4 cm)

**Indicating Hydrocarbon Trap for Air Compressors**

- Pass compressed air from an oil-filled air compressor through this trap, to remove oil vapors and mist.
- Indicator changes from pale pink to deep pink.

Description	Fittings	qty.	cat.#	price
Indicating Hydrocarbon Trap for Air Compressors	1/8" Brass	ea.	20637	
Indicating Hydrocarbon Trap for Air Compressors	1/4" Brass	ea.	20636	



Dimensions: 6" x 1" (15.2 x 2.5 cm)

**High-Capacity Split Vent Trap**

- Reduces the release of hazardous materials from the capillary split vent into the lab.
- Includes connecting lines and mounting kit.

Description	Fittings	qty.	cat.#	price
High-Capacity Split Vent Trap	1/8"	ea.	20698	
High-Capacity Split Vent Trap	1/8"	5-pk.	20699	



Dimensions: 6" x 1" (15.2 x 2.5 cm)

**ECD Vent Trap**

- Reduces the release of hazardous materials from the ECD vent into the lab.
- Includes connecting lines and mounting kit.

Description	Fittings	qty.	cat.#	price
ECD Vent Trap	1/8"	ea.	22017	

**Carrier Gas Purity**

Carrier gas should contain less than 1 ppm of oxygen, moisture, or other trace contaminants, to prevent column degradation, increase column lifetime, and decrease stationary phase bleed.

The expense of using high-purity gases in combination with carrier gas line purifiers will be offset by longer column lifetime and less GC maintenance.

## Restek Super-Clean Gas Filters

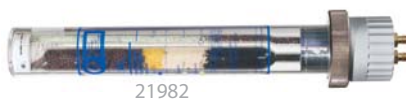
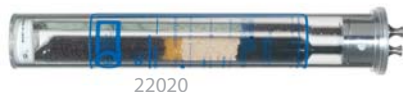
- High-purity output ensures 99.9999% pure gas (at max. flow of 2 L/min.).
- “Quick connect” fittings for easy, leak-tight cartridge changes.
- Glass inside to prevent diffusion; polycarbonate housing outside for safety.
- All traps measure 10<sup>5</sup>/<sub>8</sub>" x 1<sup>3</sup>/<sub>4</sub>" (27 x 4.4 cm).
- Each base plate unit measures 4" x 4" x 1<sup>7</sup>/<sub>8</sub>" (10.2 x 10.2 x 4.8 cm).

**Table I** Each Super-Clean gas filter provides high-purity outlet gas.

Type of Filter	Outlet Gas Quality (%)	Maximum Pressure/ Maximum Flow Rates	Use for:	Indicator Color Change	Capacity			Estimated Lifetime (years)
					H <sub>2</sub> O (g)	O <sub>2</sub> (mL)	Hydrocarbons (g)	
Moisture cat.# 22028	> 99.9999	11 bar 159 psi/ 7 L/min.	Inert carrier gas Air Hydrogen	Yellow/orange to clear	7.2	—	—	> 2
Oxygen cat.# 22029	> 99.9999	11 bar 159 psi/ 7 L/min.	Inert carrier gas	Green to grey	NA	1,000	—	> 2
Hydrocarbons cat.# 22030	> 99.9999	11 bar 159 psi/ 7 L/min.	Inert carrier gas Air Hydrogen	No indicator	NA	—	12 <sup>1</sup>	> 2
Fuel Gas <sup>1</sup> cat.# 22022	> 99.9999	11 bar 159 psi/ 7 L/min.	Inert carrier gas Air Hydrogen	Yellow/orange to clear	3.5	—	24 <sup>3</sup>	> 1.5
Triple <sup>2</sup> cat.# 22020	> 99.9999	11 bar 159 psi/ 7 L/min.	Inert carrier gas	Yellow/orange to clear Green to grey	1.8	500	4 <sup>3</sup>	> 1
Helium Specific <sup>2</sup> cat.# 21982	> 99.9999	11 bar 159 psi/ 7 L/min.	Helium	Yellow/orange to clear Green to grey	1.8	500	—	> 1

<sup>1</sup>Removes hydrocarbons, moisture.<sup>2</sup>Removes hydrocarbons, moisture, oxygen.<sup>3</sup>As *n*-butane.did you  
know?

All Restek Super-Clean gas filter cartridges (except hydrocarbon filter cat.# 22030) feature easy-to-read indicators. The indicator code is shown on every trap so there is no confusion about when to replace it.



## Restek Super-Clean Gas Filter Kits and Replacements

Description	qty.	cat.#	price
Carrier Gas Cleaning Kit			
Includes: mounting base plate, 1/8" inlet/outlet fittings, and oxygen/moisture/hydrocarbon Triple Gas Filter	kit	22019	
Fuel Gas Purification Kit			
Includes: mounting base plate, 1/8" inlet/outlet fittings, and hydrocarbon/moisture Fuel Gas Filter	kit	22021	
Ultra-High Capacity Hydrocarbon Filter	ea.	22030	
Ultra-High Capacity Moisture Filter	ea.	22028	
Ultra-High Capacity Oxygen Filter	ea.	22029	
Replacement Triple Gas Filter (removes oxygen, moisture and hydrocarbons)	ea.	22020	
Replacement Fuel Gas Filter (removes moisture and hydrocarbons)	ea.	22022	
Helium-Specific Carrier Gas Cleaning Kit			
Includes: mounting base plate, 1/8" inlet/outlet fittings, and oxygen/moisture/hydrocarbon Helium-Specific Filter	kit	21983	
Replacement Helium-Specific Gas Filter (removes oxygen, moisture and hydrocarbons)	ea.	21982	
Gas Filter Bundle Kit			
Includes: one Triple Gas Filter (cat.# 22020) and two Fuel Gas Filters (cat.# 22022)	kit	22031	



## Oxygen and Moisture Traps

Restek highly recommends oxygen and moisture traps for make-up gas when operating sensitive detectors such as electron capture detectors (ECD). The hydrogen reaction gas for sensitive electrolytic conductivity detectors (ELCD) also requires a hydrocarbon trap, to remove trace impurities.



22026



22025



22027

### Restek Filter Base Plates

- Standard base plate fittings are 1/8". To adapt to 1/4", order 1/8" to 1/4" tube-end unions.
- End fittings available in brass or stainless steel.
- Base plates fit all Super-Clean gas filters listed.

Description	qty.	Brass		Stainless Steel	
		cat.#	price	cat.#	price
Filter Base Plate, Single-Position	ea.	22025	\$231	ea. 22344	
Filter Base Plate, 2-Position	ea.	22026	\$425	ea. 22345	
Filter Base Plate, 3-Position	ea.	22027	\$609	ea. 22346	

### Wall Mounting Bracket

Base plates can be mounted by using screws and the mounting holes on the base plate, or by using this optional wall mounting bracket.



Description	qty.	cat.#	price
Wall Mounting Bracket for Super-Clean Base Plates	ea.	21984	

### Replacement O-Rings for Cartridge Base Plates

Pack includes 10 large O-rings and 10 small O-rings.



Description	qty.	cat.#	price
Replacement O-Rings for Cartridge Base Plates	20-pk.	22023	

### 1/8-Inch to 1/4-Inch Tube-End Unions

To adapt 1/8" Super-Clean base plate fittings to 1/4", use 1/8" to 1/4" tube-end unions.



21833

Description	qty.	Brass		Stainless Steel	
		cat.#	price	cat.#	price
Tube-End Reducer, 1/8" tube to 1/4"	5-pk.	21833	\$31	2-pk. 21933	

### Restek Super-Clean Gas Trapping System for LC/MS

A Super-Clean quick-change cartridge system efficiently removes hydrocarbons from nitrogen!

- Changing filters is quick and easy.
- Up to 20 L of hydrocarbon-free nitrogen per minute.
- Filters connected in parallel to handle high flows of LC/MS.



20 L of purified nitrogen per minute!

#### Super-Clean Gas Filters provide high-purity outlet gas

Type of filter:	Hydrocarbon (charcoal)
Max. Flow:	20 L/min.
Outlet Gas Quality %:	99.9999%
Maximum Pressure:	11 bar/159 psi
Estimated Lifetime:	3 to 6 months

Description	qty.	cat.#	price
Super-Clean Gas-Trapping System (2-position base plate, 2 charcoal filters)	ea.	22062	
Replacement Hydrocarbon (Charcoal) Filters	2-pk.	22061	

also **available**

### Looking for a nitrogen generator for your LC/MS?

Restek offers a full line of Parker LC/MS generators.

See **page 307**.



## Catch the Buzz

Sign up for Restek's e-newsletter, *The Buzz*

**[www.restek.com/buzz](http://www.restek.com/buzz)**

**Restek Click-On Inline Super-Clean Purification Gas Traps**

- High-purity output ensures 99.9999% pure gas.
- Click-On fittings for easy, leak-tight cartridge changes; brass or stainless steel,  $\frac{1}{4}$ " or  $\frac{1}{8}$ ".
- Helium-Specific Triple Gas Trap is ideal for GC/MS—it contains oxygen, moisture, and hydrocarbon scrubbers in one cartridge.
- Triple Gas Trap is ideal for purifying carrier gas—it contains oxygen, moisture, and hydrocarbon scrubbers in one cartridge.
- Fuel Gas Trap is ideal for purifying flame ionization detector (FID) fuel gases, removing both moisture and hydrocarbons.

Click-On adaptor connectors allow cartridges to be exchanged without introducing oxygen, moisture, and hydrocarbons. Spring-loaded check valves seal when a filter is removed and open only when a new filter has been locked in place.

Filter Type	Gas Quality at Outlet	Maximum Pressure	Maximum Flow (L/min.)	Use For	H <sub>2</sub> O (g)	Capacity O <sub>2</sub> (mL)	Hydrocarbons (g) ( <i>n</i> -butane)	Estimated Lifetime (years)
Moisture cat.#22467	>99.9999	11 bar 160 psi	25	Inert carrier gas, helium, air, H <sub>2</sub>	15	NA	NA	>3
Oxygen cat.#22468	>99.9999	11 bar 160 psi	25	Inert carrier gas	NA	2,000	NA	>3
Hydrocarbon cat.#22466	>99.9999	11 bar 160 psi	25	Inert carrier gas, helium, air, H <sub>2</sub>	NA	NA	24	>3
Fuel Gas <sup>1</sup> cat.#22465	>99.9999	11 bar 160 psi	25	Inert carrier gas, helium, air, H <sub>2</sub>	7	NA	12	>2
Triple <sup>2</sup> cat.#22464	>99.9999	11 bar 160 psi	25	Inert carrier gas	4	1,000	8	>2

<sup>1</sup>Removes hydrocarbons, moisture.

<sup>2</sup>Removes hydrocarbons, moisture, oxygen.

NOTE: Super-Clean Gas Filters are recommended for purifying noncorrosive gases with low concentrations of contaminants. The maximum concentration of oxygen in the incoming gas stream for oxygen purifiers is 0.5%.

See next page for more Click-On Inline Super-Clean products.

Click-On Traps measure:  
8½" x 1¼" (21.6 x 3.2 cm)

**did you know?**

Trap replacement depends on the quality of the incoming gas. Use the double connector and install an indicating cartridge after a trap to indicate when the trap should be replaced.

**Restek Click-On Inline Super-Clean Gas Traps and Connector Kits**

Description	qty.	cat.#	price
<b>Carrier Gas Purification Kit</b>			
Includes: (2) $\frac{1}{8}$ " SS connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22456	
Includes: (2) $\frac{1}{8}$ " brass connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22457	
Includes: (2) $\frac{1}{4}$ " SS connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22458	
Includes: (2) $\frac{1}{4}$ " brass connectors and (1) oxygen/moisture/hydrocarbon triple trap	kit	22459	
<b>Fuel Gas Purification Kit</b>			
Includes: (4) $\frac{1}{8}$ " SS connectors and (2) hydrocarbon/moisture traps	kit	22460	
Includes: (4) $\frac{1}{8}$ " brass connectors and (2) hydrocarbon/moisture traps	kit	22461	
Includes: (4) $\frac{1}{4}$ " SS connectors and (2) hydrocarbon/moisture traps	kit	22462	
Includes: (4) $\frac{1}{4}$ " brass connectors and (2) hydrocarbon/moisture traps	kit	22463	



To prevent settling of dessicant, mount vertically, not horizontally.



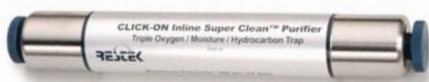
### Click-On Inline Super-Clean Indicator

- Oxygen: green to grey
- Moisture: beige to clear

Description	qty.	cat.#	price
Click-On Inline Super-Clean Indicator (oxygen, moisture)	ea.	22474	

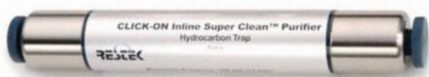


Install an indicator after the Click-On inline gas filter so there is no confusion about when to replace the traps.



### Click-On Inline Super-Clean Replacement Gas Traps

Description	qty.	cat.#	price
Triple Trap (removes oxygen, moisture and hydrocarbons)	ea.	22464	
Fuel Gas Trap (removes moisture and hydrocarbons)	ea.	22465	



### Click-On Inline Super-Clean Ultra-High Capacity Gas Traps

Description	qty.	cat.#	price
Ultra-High Capacity Hydrocarbon Trap	ea.	22466	
Ultra-High Capacity Moisture Trap	ea.	22467	
Ultra-High Capacity Oxygen Trap	ea.	22468	

### Click-On Inline Super-Clean Connectors

Click-On connectors allow you to change traps quickly, without introducing oxygen into your system.

Each connector is 2<sup>3</sup>/<sub>8</sub>" (6 cm) in length.



Description	Fittings	qty.	cat.#	price
Click-On Inline Super-Clean Connectors	1/8" Brass	2-pk.	22475	
Click-On Inline Super-Clean Connectors	1/8" Stainless Steel	2-pk.	22476	
Click-On Inline Super-Clean Connectors	1/4" Brass	2-pk.	22477	
Click-On Inline Super-Clean Connectors	1/4" Stainless Steel	2-pk.	22478	

### Click-On Inline Super-Clean Double Connector

Connects any Click-On trap to a Click-On indicator.

Each double connector is 3" (8 cm) in length.



Description	qty.	cat.#	price
Click-On Inline Super-Clean Double Connector, Stainless Steel	ea.	22479	\$215



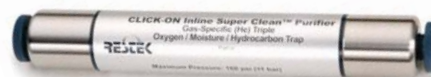
### Accessories

for Inline Super-Clean Gas Traps and Connectors

Description	qty.	cat.#	price
Wall-Mounting Clamps for Click-On Inline Super-Clean Gas Traps	4-pk.	22480	
Replacement O-Rings for Click-On Inline Super-Clean Connectors (includes 10 large and 10 small)	20-pk.	22481	

### Helium-Specific Click-On Inline Super-Clean Gas Trap and Connector Kits

Description	qty.	cat.#	price
<b>Helium-Specific Carrier Gas Cleaning Kits</b>			
Includes: (2) 1/8" SS connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22469	
Includes: (2) 1/8" brass connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22470	
Includes: (2) 1/4" SS connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22471	
Includes: (2) 1/4" brass connectors and (1) oxygen/moisture/hydrocarbon helium-specific triple trap	kit	22472	
<b>Replacement Trap</b>			
Helium-Specific Replacement Triple Trap (removes oxygen, moisture and hydrocarbons)	ea.	22473	



### did you know?

Helium-Specific Click-On Inline Super-Clean Gas Trap and Kits are designed specifically for purification of helium in GC/MS systems.

### VICI® Mat/Sen® Gas-Specific Purifier Modules

- Replace separate oxygen, moisture, and hydrocarbon traps with one multiple-bed purifier, specific for purifying helium, hydrogen, nitrogen, or air.
- Reduce gas impurities from ppm to low ppb levels.
- Decrease baseline noise and increase GC/MS sensitivity.
- Prepurged with the specified gas, to shorten downtime.

Performance for these purifiers is optimized by incorporating a multiple-bed format that progressively lowers concentrations of contaminants at each successive bed. VICI® Mat/Sen® purifiers are guaranteed to produce gases that are purer than 99.9999%, when supplied with gas of 99.995% purity, and are prepurged with the specified gas to speed conditioning. Purifier capacity is approximately four tanks of gas at 99.995% (50 ppm) purity, and correspondingly longer for purer gases.



Dimensions: 21" x 1 1/2"  
(53.3 x 3.8 cm)

Please Note: We recommend using an indicating oxygen trap (e.g., cat.# 22029, pg. 225) downstream from a VICI® Mat/Sen® purifier to continually ensure gas purity and indicate absolute change-out time.

#### Specifications:

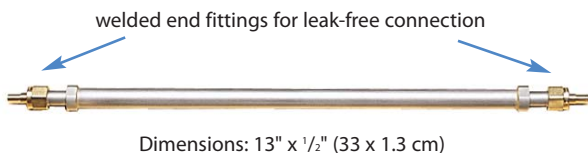
Length	21" (53.3 cm)
Diameter	1.5" (3.8 cm)
Maximum Inlet Pressure	1,000 psi (6895 kPa)
Maximum Recommended Flow	500 mL/min.
Pressure Drop from 120 psi (827 kPa)	
inlet at 0-500mL/min.:	<0.20 psi (1.4 kPa)
End Fittings	compression, 1/8" or 1/4", stainless steel
Shipping Weight	3.04 lb. (1,300 g)

#### Gas-Specific Purifier Module

#### Compression Tube Fittings

	qty.	1/4-inch		qty.	1/8-inch	
		cat.#	price		cat.#	price
Helium Purifier Module	ea.	22600		ea.	22601	
Hydrogen Purifier Module	ea.	22602		ea.	22603	
Nitrogen Purifier Module*	ea.	22604		ea.	22605	
Air Purifier Module	ea.	22606		ea.	22607	

\*Warning: Do not use with nitrogen containing more than 500 ppm of oxygen. If the oxygen level in the stream exceeds 500 ppm, use an air purifier.



Dimensions: 13" x 1/2" (33 x 1.3 cm)

### Thermal Gas High Capacity Purifier Replacement Getter Tube

Each replacement getter tube has 12 L oxygen and 35 L water vapor capacity at a minimum flow rate of 1 liter/minute and removes oxygen, water, carbon monoxide, carbon dioxide, hydrocarbons (except methane) to ppb levels; pure enough for MS. Typically requires replacement once per year.

Change tube when gas pressure drops.

Replacement Getter Tubes	qty.	cat.#	price
1/8" Fittings (Similar to Supelco part# 2-2396)	ea.	21661	
1/4" Fittings (Similar to Supelco part# 2-2398)	ea.	21660	

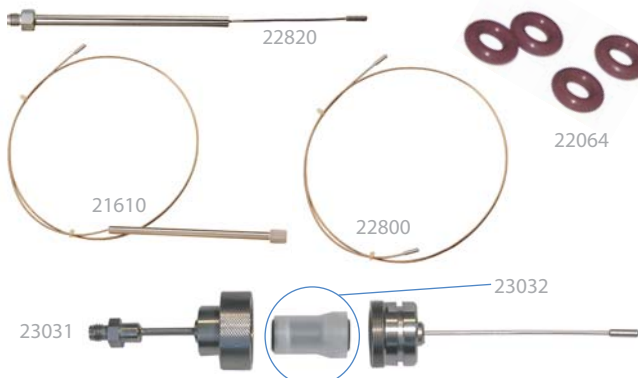
Replacement getter tubes must be used with a Thermal Gas Purifier housing unit.

### Gas Pressure Gauge Kit

- Use an in-line pressure gauge to indicate when a thermal gas purifier getter tube should be replaced.
- Includes 1/8" tee and 0–100 psi (0–689 kPa) gauge.



Description	qty.	cat.#	price
In-line Gas Pressure Gauge Kit for Thermal Gas Purifiers	kit	21657	



### Replacement Chemical Traps

- Easy to install.
- Attach to same fittings as original manufacturer's equipment.
- Built-in frits retain fine particles; adsorbents remove both moisture and hydrocarbons.

Description	Similar to Agilent part #	qty.	cat.#	price
Replacement Split Vent Trap for Agilent 6890/6850 GCs	G1544-80550	ea.	22820	
Replacement Chemical Trap for Agilent 5890 GCs	05890-61260	ea.	21610	
Split Vent Line (32-inch) for Agilent GCs				
Includes: all installation hardware	19251-80525	2-pk.	22800	
O-Rings for Agilent Trap Fittings	5180-4181	25-pk.	22064	
Optional Split Vent Trap Assembly for Agilent 6890/6850 GCs	G1544-60610	kit	23031	
Replacement Traps (2) and O-Rings (4)	G1544-80530	kit	23032	



Eliminate ghost peaks—change your chemical trap often!



### Parker Balston® PEM Hydrogen Generators

- Proton Exchange Membrane (PEM) cell eliminates the need for liquid electrolytes.
- Reliably generate 99.9995% pure hydrogen—for better chromatography.
- Eliminates high-pressure cylinders—greater convenience and improved lab safety.
- Compact unit, requiring only one square foot of bench space.
- Quick and easy to service and maintain; unique display lighting changes color for easy status checks and water level indication.
- Comes with a set of universal power adapters for US, European, and Asian plug types.



Fuel-grade high purity hydrogen generators are safer alternatives to high-pressure gas cylinders. The new Proton Exchange Membrane (PEM) cell eliminates the use of liquid electrolytes with hydrogen generators. Deionized water is all that is required to generate hydrogen for weeks of continuous operation. With an output capacity of up to 510 cc/minute, one generator can supply 99.9995% pure hydrogen for up to several FIDs. Based on cylinder gas savings alone, a hydrogen generator pays for itself in one or two years.

Produced and supported by an ISO 9001 registered organization, Parker Balston® hydrogen generators are the first built to meet the toughest laboratory standards in the world: CSA, UL, cUL, and CE Mark. A great safety feature is the built-in sensing circuit, which shuts the generator down if a hydrogen leak is detected.

#### Specifications

Purity:	99.9995% pure hydrogen
Delivery Pressure:	10-100 psig $\pm$ 1 psig (69-689 kPa $\pm$ 7 kPa)
Outlet Port:	$1/8$ " compression
Electrical Requirements:	100-230 VAC/50-60 Hz
Physical Dimensions:	17.12" h x 13.46" w x 17.95" d (43.48 x 34.19 x 45.6 cm)
Shipping Weight:	40 lbs. (18 kg) dry



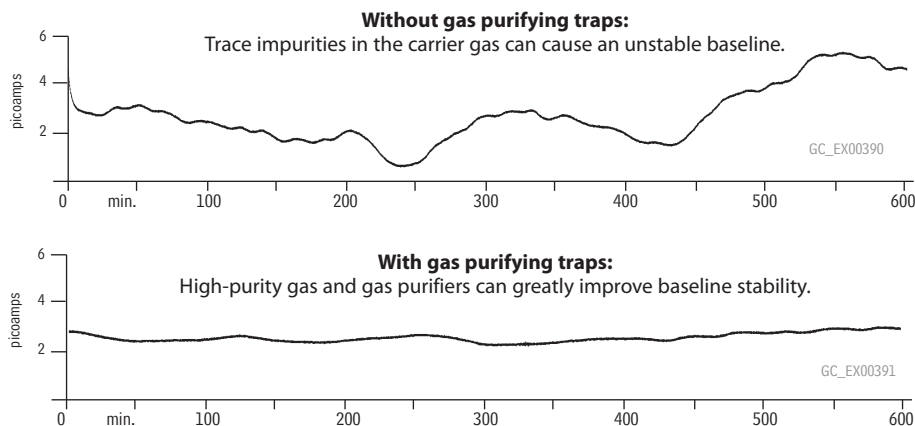
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#### Parker Balston® Hydrogen Generators

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lit. cat.# 580053A

Description	Model #	Capacity	qty.	cat.#	price
Hydrogen Generator	H2PEM-100	100cc/min.	ea.	23065	
Hydrogen Generator	H2PEM-165	165cc/min.	ea.	23066	
Hydrogen Generator	H2PEM-260	260cc/min.	ea.	23067	
Hydrogen Generator	H2PEM-510	510cc/min.	ea.	23068	
<b>Replacement and Maintenance Components for Hydrogen Generators (for all models listed above)</b>					
Replacement Desiccant Cartridge for H2PEM Generators			ea.	23069	
6-Month Maintenance Kit for H2PEM Generators					
Includes: 1 deionizer cartridge, 1 water filter, 3 environmental filters			kit	23070	
24-Month Maintenance Kit for H2PEM Generators					
Includes: 1 deionizer cartridge, 1 water filter, 3 environmental filters, 1 water level sensor, 1 water pump, and 1 desiccant cartridge			kit	23071	

**The combination of high-purity gas and gas purifying traps can save analytical time in the long run.**



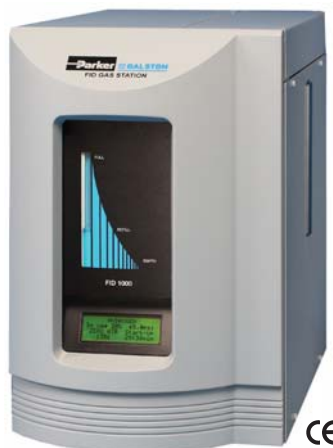
Using purifying gas  
traps in combination  
with a gas generator  
can improve chro-  
matography tremen-  
dously and improve  
column lifetime.

**Parker Balston® Model FID-1000 and FID-2500 Gas Stations**

- Single unit produces UHP zero air from house compressed air and 99.9995% pure hydrogen from deionized water.
- Ideal for supplying up to 5-6 FIDs.
- Eliminates inconvenient and dangerous gas cylinders.
- Silent operation, minimal operator attention required.

Parker Balston® Gas Stations provide both UHP grade hydrogen gas and zero grade air for flame ionization detectors. The system is specifically designed to supply gas to FIDs and to support flame thermionic and flame photometric detectors. The units produce zero air by purifying compressed air to a total hydrocarbon concentration of 0.1 ppm or less (measured as methane).

The hydrogen generators produce hydrogen gas from deionized water, using the principle of electrolytic dissociation of water and hydrogen proton conduction through a proton exchange membrane cell.



Produce zero air and pure hydrogen from one unit!

**Specifications**

Hydrogen Purity:	99.9995%	Power:	120 VAC/amp, 60 Hz, 400 watts
Zero Air Purity:	FID-1000:	Hydrogen Outlet Pressure:	60 psig (414 kPa)
	< 0.1 ppm total hydrocarbons as methane	Zero Air Outlet Pressure:	40-125 psig* (276-862 kPa)
	FID-2500:	Inlet Connection:	1/4" NPT (female)
	< 0.05 ppm total hydrocarbons as methane	Outlet:	1/8" compression
Max. Hydrogen Flow Rate:	FID-1000: 90 cc/min.	Dimensions:	16.5"h x 10.5"w x 17"d
	FID-2500: 250 cc/min.		(42 cm x 27 cm x 43 cm)
Max. Zero Air Flow Rate:	FID-1000: 1000 cc/min.	Weight:	53 lbs. (24kg)
	FID-2500: 2500 cc/min.		

\*Zero air inlet requires minimum of 40 psig (276 kPa) compressed air pressure.



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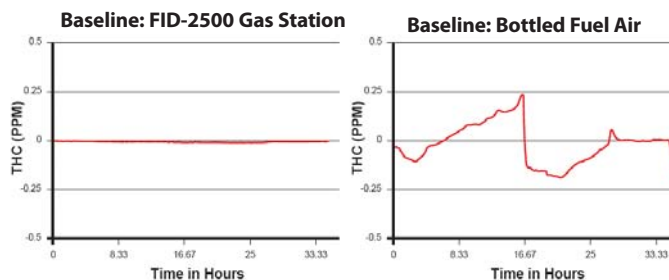
**FID Gas Stations**

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lit. cat.# 580051

**ordering note**

For **international orders**, please add the appropriate power cord suffix from the table below.

Compare baselines produced by a Parker Balston® FID Gas Station and bottled fuel air. The baseline produced by the Parker Balston® Generator is flat, with no fluctuations or peaks; the chromatogram from the bottled air fuel supply has many peaks ranging from 0.25 ppm to -0.25 ppm total hydrocarbons.



Description	Model #	qty.	cat. #	price
Gas Station	Model FID-1000 (ideal for 1-2 FIDs)	ea.	20177	
Gas Station	Model FID-2500 (ideal for 5-6 FIDs)	ea.	24913	
<b>Replacement Components for FID Gas Stations</b>				
Resin Bed Cartridge for Hydrogen Generators in FID-1000 and FID-2500 Gas Stations		ea.	24914	
Replacement Desiccant Cartridge		ea.	21671	
FID Gas Station Maintenance Kit				
Includes: 1 desiccant cartridge, 1 resin bed cartridge, 1 filter cartridge		ea.	24915	

**International Power Cord Sets**

Just add the proper suffix to the catalog number for the gas generator you are ordering.

Location	qty.	cat.# suffix	price
United Kingdom (230VAC, 50/50Hz)	ea.	-550	
European (230VAC, 50/60Hz)	ea.	-551	
IEC Connector Only (230VAC, 50/60Hz)	ea.	-552	
Japanese (200VAC, 50/60Hz)	ea.	-556	
Japanese for Zero Air (100VAC, 50/60Hz)	ea.	-553	
Japanese for Hydrogen (100VAC, 50/60Hz)	ea.	-554	
Japanese for Nitrogen (100VAC, 50/60Hz)	ea.	-555	

Select the power cord you need.



www.restek.com **305**



21654



### Parker Balston® Nitrogen Gas Generators

- Produces ultra-pure nitrogen (up to 99.9995%).
- Flows from 1 to 75+ lpm.
- Require only a compressed air source and 110 volt AC power.
- Typical applications include GC carrier gas, make-up gas, and low flow sample concentrators.
- Maintenance kits include replacement filters.

#### Specifications

	Model HPN2-1100 or UHPN2-1100	Model HPN2-2000
Maximum Nitrogen Flow Rate:	See Flow Table	2 lpm
Nitrogen Purity:	99.9999%	99.99%
Minimum/Maximum Inlet Pressure:	60 psig/125 psig (414/862kPa)	75 psig/120 psig (517/827kPa)
Electrical Requirements:	120 VAC/60 Hz	120 VAC/60 Hz
Dimensions:	35"h x 12"w x 16"d (89cm x 30cm x 41cm)	35"h x 12"w x 16"d (89cm x 30cm x 41cm)
Shipping Weight:	115 lbs. (52 kg)	115 lbs. (52 kg)

#### Note:

Models HPN2-1100 and HPN2-2000 do not remove hydrocarbons.

\*Power consumption is:

Model HPN2-1100

= 25 Watts

Model UHPN2-1100

= 700 Watts

Model HPN2-2000

= 25 Watts

#### Flow Table for Models HPN2-2000, HPN2-1100, and UHPN2-1100

Inlet Air Pressure	Maximum Outlet Flow (cc/min.)	Maximum Outlet Pressure
Models HPN2-1100 and UHPN2-1100		
125 psig (862kPa)	1100	85 psig (586kPa)
110 psig (758kPa)	1000	75 psig (517kPa)
100 psig (689kPa)	900	65 psig (448kPa)
90 psig (621kPa)	800	60 psig (414kPa)
80 psig (552kPa)	700	50 psig (345kPa)
70 psig (483kPa)	600	45 psig (310kPa)
60 psig (414kPa)	500	35 psig (241kPa)
Model HPN2-2000		
75-120 psig (517-827kPa)	2000	90 psig (621kPa)



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#### Nitrogen Generators

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lit. cat.# 580052

### ordering note

For **international orders**, please add the appropriate power cord suffix from the table below.

Nitrogen Generators	Model #	qty.	cat.#	price
Nitrogen Generator	HPN2-2000 (high purity)	ea.	21654	
Nitrogen Generator	HPN2-1100 (ultra-high purity)	ea.	21653	
Nitrogen Generator	HPN2-1100 with European Cord Set	ea.	21653-551	
Nitrogen Generator	HPN2-1100 with IEC Connector Only	ea.	21653-552	
Nitrogen Generator	UHPN2-1100 (ultra-high purity zero grade)	ea.	20697	
Maintenance Kits	Model #	qty.	cat.#	price
Maintenance Kit	for HPN2-1100, HPN2-2000, 76-96, 76-92	kit	21649	
Maintenance Kit	for UHPN2-1100, 76-94	kit	21655	

### International Power Cord Sets

Just add the proper suffix to the catalog number for the gas generator you are ordering.

Location	qty.	cat.# suffix	price
United Kingdom (230VAC, 50/50Hz)	ea.	-550	
European (230VAC, 50/60Hz)	ea.	-551	
IEC Connector Only (230VAC, 50/60Hz)	ea.	-552	
Japanese (200VAC, 50/60Hz)	ea.	-556	
Japanese for Zero Air (100VAC, 50/60Hz)	ea.	-553	
Japanese for Hydrogen (100VAC, 50/60Hz)	ea.	-554	
Japanese for Nitrogen (100VAC, 50/60Hz)	ea.	-555	

Select the power cord you need.

**Parker Balston® Nitrogen Gas Generators for LC/MS**

- Turn compressed air into ultra-pure nitrogen (up to 99.5%).
- Flows from 1 to 44 lpm.
- Models N2-04, N2-14, N2-22, and N2-35 require no electricity.
- Safe, reliable, low maintenance.
- Maintenance kits include replacement filters.



22130



22129



Specifications	NitroFlow Lab	N2-04	N2-14 or N2-14A	N2-22 or N2-22A	N2-35 or N2-35A
Maximum Nitrogen Flow Rate:	32 lpm	8 lpm	78scfh at 95% purity	N2-22: 44 lpm N2-22A: 29 lpm	44 lpm
Nitrogen Purity:	99.50%	99%	95.0%–99.5%	99%	99%
Min/Max Inlet Pressure:	N/A	60 psig/145 psig	60 psig/145 psig	60 psig/145 psig	60 psig/145 psig
Electrical Requirements:	120VAC/60Hz	None	N2-14: None N2-14A: 120VAC/60Hz	N2-22: None N2-22A: 120VAC/60Hz	N2-35: None N2-35A: 120VAC/60Hz
Dimensions:	27.6" h x 35.4" w x 12.2" d (70cm x 90cm x 31cm)	11" h x 13" w x 16" d (27cm x 34cm x 41cm)	50" h x 16" w x 16" d (127cm x 41cm x 41cm)	50" h x 16" w x 16" d (127cm x 41cm x 41cm)	50" h x 16" w x 16" d (127cm x 41cm x 41cm)
Shipping Weight:	205 lbs. (93 kg)	43 lbs. (20 kg)	N2-14: 75 lbs. (34 kg) N2-14A: 80 lbs. (36 kg)	N2-22: 101 lbs. (46 kg) N2-22A: 106 lbs. (48 kg)	N2-35: 115 lbs. (52 kg) N2-35A: 119 lbs. (54 kg)

Nitrogen Generators for LC/MS	Model #	qty.	cat.#	price
Nitrogen Generator for LC/MS	NitroFlow Lab Model, 32 lpm max. flow	ea.	22129	
Nitrogen Generator for LC/MS	N2-04 Model for ELSD, 8 lpm max. flow	ea.	22130	
Nitrogen Generator for LC/MS	N2-14 (general purpose) 78 scfh max. flow at 95% purity	ea.	20677	
Nitrogen Generator for LC/MS	N2-14 with European Power Cord	ea.	20677-551	
Nitrogen Generator for LC/MS	N2-14A (general purpose w/oxygen analyzer) 78 scfh max. flow at 95% purity	ea.	21652	
Nitrogen Generator for LC/MS	N2-22 Model, 44 lpm max. flow	ea.	22131	
Nitrogen Generator for LC/MS	N2-22A Model, 29 lpm max. flow	ea.	22132	
Nitrogen Generator for LC/MS	N2-35 Model, 44 lpm max. flow	ea.	22133	
Nitrogen Generator for LC/MS	N2-35A Model, 44 lpm max. flow	ea.	22134	
Maintenance Kits	Model #	qty.	cat.#	price
Maintenance Kit	for N2-14, N2-14A, 75-72, 75-720NA	kit	21648	
Maintenance Kit with Carbon Filter	for N2-14, N2-14A, 75-72, 75-720NA	ea.	22135	

### ordering note

For **international orders**, please add the appropriate power cord suffix from the table on the previous page.

## Restek Electronic Leak Detector...



Go to [www.restek.com/leakdetector](http://www.restek.com/leakdetector) for details.

## ...and Introducing the NEW Restek ProFLOW 6000 Electronic Flowmeter



Go to [www.restek.com/flowmeter](http://www.restek.com/flowmeter) for details.

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### Parker Balston® Zero Air Generators

- Turn in-house compressed air into ultra-pure air (<0.1 ppm total hydrocarbons).
- Remove hydrocarbons to less than 0.1 ppm by catalytic oxidation.
- Operate at 40 to 125 psi (276-862 kPa).
- Typical payback is less than one year, based on cylinder costs.
- Install easily and take up little bench space.
- Maintenance kits include a one year supply of prefilters and final filter.



CE

Model	Number of FIDs*
75-83NA	Up to 3
HPZA-3500	Up to 11
HPZA-7000	Up to 23
HPZA-18000	Up to 60
HPZA-30000	Up to 100

\*based on a 300 cc/min. fuel air rate

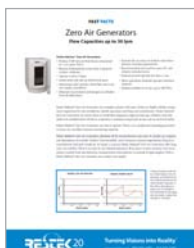
#### Specifications

Maximum Zero Air Flow Rate:	75-83NA	1 lpm
	HPZA-3500	3.5 lpm
	HPZA-7000	7 lpm
	HPZA-18000	18 lpm
	HPZA-30000	30 lpm
Outlet Hydrocarbon Concentration (as methane):	75-83NA	< 0.1 ppm
	HPZA-30000	< 0.1 ppm
	Other Models	< .05 ppm
Minimum/Maximum Inlet Air Pressure:	40 psig/125 psig (276/862 kPa)	
Maximum Inlet Hydrocarbon Concentration (as methane):	100 ppm	
Pressure Drop at Maximum Flow Rate:	4 psi (28 kPa) differential	
Maximum Inlet Air Temperature:	78°F (25°C)	
Inlet/Outlet Ports:	1/4" NPT (female)	
Start-up Time to Specified Hydrocarbon Concentration:	45 minutes	
Electrical Requirements:	75-83NA	120 VAC/60 Hz, 0.5 amps
	Other Models	120 VAC/60 Hz, 3.5 amps
Dimensions:	75-83NA	12"h x 10"w x 3"d (30 cm x 25 cm x 8 cm)
	Other Models	16"h x 11"w x 13"d (42 cm x 27 cm x 3 cm)
Shipping Weight:	75-83NA	7 lbs. (3 kg)
	Other Models	41 lbs. (19 kg)

### ordering note

For **international orders**, please add the appropriate power cord suffix from the table below.

Zero Air Generator	Model #	Capacity	qty.	cat. #	price
Zero Air Generator	75-83NA	1000cc/min.	ea.	20684	
Zero Air Generator	75-83NA with United Kingdom Power Cord	1000cc/min.	ea.	20684-550	
Zero Air Generator	HPZA-3500	3500cc/min.	ea.	20680	
Zero Air Generator	HPZA-3500 with European Power Cord	3500cc/min.	ea.	20680-551	
Zero Air Generator	HPZA-7000	7000cc/min.	ea.	20681	
Zero Air Generator	HPZA-18000	18,000cc/min.	ea.	20682	
Zero Air Generator	HPZA-30000	30,000cc/min.	ea.	20683	
<b>Maintenance Kits (includes a one-year supply of prefilters and final filter)</b>				<b>qty.</b>	<b>cat. #</b>
Maintenance Kit	for 75-83NA		kit	21646	<b>price</b>
Maintenance Kit	for HPZA-3500, HPZA-7000, HPZA-18000, HPZA-30000		kit	21647	
Replacement Catalyst Towers	Model #	Capacity	qty.	cat. #	price
Replacement Catalyst Tower	for 75-83NA	1000cc/min.	ea.	22005	
Replacement Catalyst Tower	for HPZA-3500	3500cc/min.	ea.	22004	
Replacement Catalyst Tower	for HPZA-7000	7000cc/min.	ea.	22006	
Replacement Catalyst Tower	for HPZA-18000	18,000cc/min.	ea.	22007	
Replacement Catalyst Tower	for HPZA-30000	30,000cc/min.	ea.	22008	



### free literature

#### Zero Air Generators

Download your free copy from  
[www.restek.com](http://www.restek.com)

lit. cat.# 580050

### International Power Cord Sets

Just add the proper suffix to the catalog number for the gas generator you are ordering.

Location	qty.	cat.# suffix	price
United Kingdom (230VAC, 50/50Hz)	ea.	-550	
European (230VAC, 50/60Hz)	ea.	-551	
IEC Connector Only (230VAC, 50/60Hz)	ea.	-552	
Japanese (200VAC, 50/60Hz)	ea.	-556	
Japanese for Zero Air (100VAC, 50/60Hz)	ea.	-553	
Japanese for Hydrogen (100VAC, 50/60Hz)	ea.	-554	
Japanese for Nitrogen (100VAC, 50/60Hz)	ea.	-555	

**Silcosteel® Regulators**

Single and dual stage regulators are now available with Silcosteel® surface treatment. This proprietary passivation process, developed by SilcoTek™, provides excellent inertness for sulfur and mercury calibration standards and improved corrosion resistance over bare 316L stainless steel or other more expensive alloys.

Silcosteel® treated sampling and transfer systems allow oil and gas exploration, chemical and petrochemical plants, and refineries to obtain accurate sulfur and mercury data the first time, every time, with no delay, sample errors, or false readings, down to part-per-billion (ppb) levels. Analysts charged with monitoring sulfur and mercury levels in process streams can save thousands of dollars in improved yields, better test cycle times, and improved system reliability.

**Applications:**

- CEM Continuous Emission Monitoring
- Environmental Stack and Gas Emission Standards
- Low level sulfur and mercury analysis
- Reactive or corrosive gases
- Off-shore platform systems
- Corrosive and salt water exposure

Outlet pressure: 0 to 100 psig  
 Outlet gauge: 30" – 0 to 200 psig  
 Inlet gauge: 0 to 4000 psig  
 Outlet assembly: diaphragm valve, 1/4" tube fitting

Description	qty.	cat.#	price
<b>Single-Stage Regulator</b>			
CGA 330 (H <sub>2</sub> S and other reduced sulfurs)	ea.	21361-5	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	ea.	21361-6	
CGA 660 (NO, NO <sub>2</sub> , SO <sub>2</sub> )	ea.	21361-11	
<b>Dual-Stage Regulator</b>			
CGA 330 (H <sub>2</sub> S and other reduced sulfurs)	ea.	21360-2	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	ea.	21360-7	
CGA 660 (NO, NO <sub>2</sub> , SO <sub>2</sub> )	ea.	21360-12	

For other CGA fittings, please contact your local Restek representative.



**also available**

Regulators for use  
with gas standards.  
See **pages 433-434**.



## Overview of Restek's Ultra-High Purity (UHP) Gas Regulators

- Regulators feature metal-to-metal seals throughout for long-term leak-tightness.
- Metal diaphragm outlet valve ensures gas purity.
- Each regulator is helium leak-test-certifiable to  $1 \times 10^{-8}$  scc/sec.
- Temperature range: -40 °C to 60 °C

## Ultra-High Purity (UHP) Brass Body Gas Regulators

UHP brass regulators are the best choice when using ultra-high purity carrier gas for sensitive GC applications using MS, PID, or ECD detection methods. They feature reduced internal dead-volume, relative to stainless steel bodies. The metal valve diaphragm ensures leak-free shut-off. Oxidation-resistant chrome plating maintains a like-new appearance.

### Dual-Stage Ultra-High Purity Chrome-Plated Brass Gas Regulators

- Oxidation-resistant, chrome-plated.
- Most stable outlet pressure control.
- Secondary pressure regulation not needed.
- Most widely used regulator.
- Less internal volume than stainless steel gas regulators.

Inlet gauge: 0 to 4,000psig (0-27,579kPa)  
 Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
CGA 580 (N <sub>2</sub> , He, Ar)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	21667	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	21668	
CGA 590 (Air)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	21669	

### Single-Stage Ultra-High Purity Chrome-Plated Brass Gas Regulators

- Oxidation-resistant, chrome-plated.
- Use when there is secondary pressure regulation downstream.
- Identical gas purity protection as with dual-stage gas regulators.

Inlet gauge: 0 to 4,000psig (0-27,579kPa)  
 Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
CGA 580 (N <sub>2</sub> , He, Ar)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	20646	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	20647	
CGA 590 (Air)	0 to 100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	20648	

### Ultra-High Purity Chrome-Plated Brass Line Gas Regulator

- Oxidation-resistant, chrome-plated.
- Use where you need to reduce the line pressure by 20 psig (138 kPa) or more.
- Same purity protection as high-pressure cylinder regulators.

Inlet connections: 1/4" FPT  
 Outlet assembly: 1/4" FPT port

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
1/4" female NPT ports*	0-50psig (0-345kPa)	30" - 0 to 100psig (0-689kPa)	ea.	21666	
1/4" female NPT ports*	0-100psig (0-689kPa)	30" - 0 to 200psig (0-1379kPa)	ea.	22452	

\*Order appropriate male connector, pipe-to-tube fittings.

### Swagelok® Male Connector, Pipe-to-Tube Fittings

Fitting Type	Size (inches)	Similar to Swagelok	Brass			Stainless Steel		
			qty.	cat.#	price	qty.	cat.#	price
Male Connector	1/4" to 1/2" NPT	400-1-4	10-pk.	23134	\$44	2-pk.	23184	
Male Connector	1/8" to 1/4" NPT	200-1-4	10-pk.	23136	\$50	2-pk.	23186	
Tube End Reducer	1/4" to 1/8"	200-R-4	5-pk.	23129	\$29	2-pk.	23179	



## Ultra-High Purity (UHP) Stainless Steel Body Gas Regulators

UHP stainless steel regulators are the standard for ultra-high-purity and corrosion-resistant pressure regulation. They are more easily purged of atmospheric components, compared to brass gas regulators, making them ideal for the most demanding applications. Stainless steel is especially useful in atmospheres of dry corrosive gases such as hydrogen.

### Dual-Stage Ultra-High Purity Stainless Steel Gas Regulators

- Most stable outlet pressure control.
- Secondary pressure regulation not needed.

Inlet gauge: 0 to 4,000psig (0-27,579kPa)  
 Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
CGA 580 (N <sub>2</sub> , He, Ar)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20662	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20663	
CGA 590 (Air)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20664	



### Single-Stage Ultra-High Purity Stainless Steel Gas Regulators

- Use when there is secondary pressure regulation downstream.
- Identical gas purity protection as with dual-stage gas regulators.

Inlet gauge: 0 to 4,000psig (0-27,579kPa)  
 Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	Outlet Pressure	Outlet Gauge	qty.	cat.#	price
CGA 580 (N <sub>2</sub> , He, Ar)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20665	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20666	
CGA 590 (Air)	0 to 100psig (0-689kPa)	30" – 0 to 200psig (0-1379kPa)	ea.	20667	



### Flexible Stainless Steel Hoses

Description	Length	Fittings	qty.	cat.#	price
Flexible Stainless Steel Hose	36"	1/4" Female NPT	ea.	21339	
Flexible Stainless Steel Hose	18"	1/4" Female NPT	ea.	21340	
Flexible Stainless Steel Hose	36"	Stainless Steel CGA 580	ea.	21344	



### Flammable Gas Flash Arrestor—Factory Mutual Approved\*

- Gas flow shuts off in the event of a flashback.
- Flame extinguished—flame front prevented from reaching the gas supply.
- No gas flow restriction under normal operating conditions.

Description	qty.	cat.#	price
Flammable Gas Flash Arrestor, Brass Body	ea.	21334	

\*Approved for brass body servicing hydrogen, acetylene, propane, or natural gas only.



21334

### CGA Fittings

CGA-specified nuts and nipples with internal frit, 1/4-inch NPT nickel-plated brass.

Description	qty.	cat.#	price
CGA 580 Fitting, (N <sub>2</sub> , He, Ar)	ea.	21336	
CGA 350 Fitting, (H <sub>2</sub> , P <sub>2</sub> )	ea.	21337	
CGA 590 Fitting, (Air)	ea.	21338	



21336

## ordering note

### International Fittings

All gas regulators are available with the following BS (British Standard) and DIN (German Industrial Standards Organization) connections. Please contact your local Restek representative for more information.

BS 341 #01	BS 341 #08	BS 341 #15	DIN 477 #06	DIN 477 #10	DIN 477 #14
BS 341 #02	BS 341 #10	DIN 477 #01	DIN 477 #07	DIN 477 #11	DIN 477 #15
BS 341 #03	BS 341 #13	DIN 477 #03	DIN 477 #08	DIN 477 #12	
BS 341 #04	BS 341 #14	DIN 477 #05	DIN 477 #09	DIN 477 #13	

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### Critical Purity Automatic Switchover System for Noncorrosive Gases

High-purity automatic switchover systems provide a continuous supply of high purity gas to the laboratory, process, or instrument, to allow you to replace a depleted gas source without interruption in the gas supply. Continuous gas supply is achieved by setting the two regulators at slightly different pressures and discharging one side of the system at a time. These models include flexible, all-stainless-steel pigtailed with armor casing. The CGA connection on each pigtail has a check valve in the gland to prevent contamination and minimize purging requirements.



Switching pressure: 200psig/170psig (1379/1172kPa)  
 Inlet connections: flexible SS pigtails (36")  
 Line regulator: 0 to 100psig (0-689kPa)

#### Brass Automatic Switchover System with Line Regulator

	qty.	cat.#	price
CGA 580 (N <sub>2</sub> , He, Ar)	ea.	20668580	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	ea.	20668350	
CGA 590 (Air)	ea.	20668590	

#### Stainless Steel Automatic Switchover System with Line Regulator

	qty.	cat.#	price
CGA 580 (N <sub>2</sub> , He, Ar)	ea.	21593580	

### Protocol Station

The protocol station is designed for convenient wall mounting of high-purity gas regulators. Wall mounting provides ease of use, prevents gas regulator damage, and improves safety. Either chrome-plated brass or 316 stainless steel option is complete with a 3-foot, flexible, all-stainless-steel pigtail with armor casing. The CGA connection on the pigtail has an integral check valve in the gland to prevent contamination during cylinder changeout.



#### Chrome-Plated Brass Protocol Station\*

	qty.	cat.#	price
CGA 580 (N <sub>2</sub> , He, Ar)	ea.	21347	
CGA 350 (H <sub>2</sub> , P <sub>2</sub> )	ea.	21348	
CGA 590 (Air)	ea.	21349	

#### Stainless Steel Protocol Station\*

	qty.	cat.#	price
CGA 580 (N <sub>2</sub> , He, Ar)	ea.	21327	

\*Pressure regulator not included. Order separately.



### Cylinder Valve Wrench

This specially-designed wrench enables easy opening of cylinder valves that are fitted with a hand wheel. It is also suitable for removing difficult cylinder caps.

Description	qty.	cat.#	price
Cylinder Valve Wrench	ea.	21321	



### Universal Cylinder Wrench

Use this versatile wrench for tightening gauges and gas regulator CGA fittings to cylinder outlets and pipe thread connections.

Description	qty.	cat.#	price
Universal Cylinder Wrench	ea.	21322	



### Backpressure Gas Regulator

Capillary GC inlet systems have backpressure regulators to maintain a constant upstream pressure and rapidly respond to catastrophic leaks. The 0–60 psig (0-414 kPa) operating range is sufficient to operate a 105 m, 0.25 mm ID column at its optimum flow rate.

Description	qty.	cat.#	price
Backpressure Gas Regulator	ea.	20635	

### MINICYL Regulator

This compact general purpose regulator has many laboratory applications including air-drying glassware, sparging or evaporating solutions, and controlling pneumatic valves. It is constructed of lightweight aluminum with an elastomer diaphragm. Includes a 0–60 psig (0-414 kPa) gauge and either 1/8- or 1/4-inch tube fittings.



Description	Fittings	qty.	cat.#	price
MINICYL Regulator	1/8" Fittings	ea.	20610	
MINICYL Regulator	1/4" Fittings	ea.	20611	



### Cylinder Holders, Wall Mounted

Prevent serious injuries! These holders are designed to prevent free-standing gas cylinders from tipping over and injuring personnel. The cast aluminum holder can be secured to a wall or the side of a work bench. Each mount will secure a cylinder 4-15 inches in diameter.

Description	Size	qty.	cat.#	price
Cylinder Holder, Wall Mounted	Single	ea.	21333	
Cylinder Holder, Wall Mounted	Double	ea.	23400	
Cylinder Holder, Wall Mounted	Triple	ea.	23401	
Cylinder Holder, Wall Mounted	Four	ea.	23402	

**Swagelok® Fitting Kits (Brass & Stainless Steel)**

Save more than 40% by purchasing a new Restek Swagelok® Fittings Kit, compared to prices for the individual parts!

- Includes the most common assortment of 1/8" and 1/4" brass or stainless steel fittings.
- Parts list makes reordering easy.
- Parts come in sturdy tool box for easy and convenient storage.



40%  
savings

**Swagelok #, Description, qty included in kit**

B-202-1	1/4" brass nut (20)
B-402-1	1/4" brass nut (20)
B-203-1	1/4" brass front ferrule (20)
B-403-1	1/4" brass front ferrule (20)
B-204-1	1/4" brass back ferrule (20)
B-404-1	1/4" brass back ferrule (20)
B-200-C	1/4" brass cap (6)
B-400-C	1/4" brass cap (6)
B-200-P	1/4" brass plug (6)
B-400-P	1/4" brass plug (6)
B-200-6	1/4" brass union (2)
B-400-6	1/4" brass union (2)
B-400-6-2	1/4" to 1/8" brass reducing union (2)
B-200-3	1/4" brass tee (2)
B-400-3	1/4" brass tee (2)
B-400-R-2	1/4" to 1/4" brass tube end reducer (2)
B-200-R-4	1/4" to 1/8" brass tube end reducer (2)
MS-IG-200	1/4" inspection gauge (1)
MS-IG-400	1/4" inspection gauge (1)

**Swagelok #, Description, qty included in kit**

SS-202-1	1/4" SS nut (20)
SS-402-1	1/4" SS nut (20)
SS-203-1	1/4" SS front ferrule (20)
SS-403-1	1/4" SS front ferrule (20)
SS-204-1	1/4" SS back ferrule (20)
SS-404-1	1/4" SS back ferrule (20)
SS-200-C	1/4" SS cap (6)
SS-400-C	1/4" SS cap (6)
SS-200-P	1/4" SS plug (6)
SS-400-P	1/4" SS plug (6)
SS-200-6	1/4" SS union (2)
SS-400-6	1/4" SS union (2)
SS-400-6-2	1/4" to 1/8" SS reducing union (2)
SS-200-3	1/4" SS tee (2)
SS-400-3	1/4" SS tee (2)
SS-400-R-2	1/4" to 1/4" SS tube end reducer (2)
SS-200-R-4	1/4" to 1/8" SS tube end reducer (2)
MS-IG-200	1/4" inspection gauge (1)
MS-IG-400	1/4" inspection gauge (1)

Description	qty.	cat.#	price
Swagelok Fitting Kit, Brass	kit	23141	

Description	qty.	cat.#	price
Swagelok Fitting Kit, Stainless Steel	kit	23197	

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## Swagelok® Fittings (Brass &amp; Stainless Steel)

Restek is pleased to offer one of the premier lines of fittings available for chromatographers in the market today. We can supply the entire line of Swagelok® fittings. If you don't see the exact product you're looking for, please call us for a quote.



nut



front ferrule



back ferrule



nut &amp; ferrule set



plug



union



reducing union



tee



cross



tube end reducer



port connector



male connector



female connector



male quick coupling



female quick coupling

Fitting Type	Size	Swagelok #	qty.	Brass		316 Grade Stainless Steel		
				cat.#	price	qty.	cat.#	price
Nut	1/16"	102-1	20-pk.	23100		5-pk.	23150	
	1/8"	202-1	40-pk.	23101		10-pk.	23151	
	1/4"	402-1	40-pk.	23102		10-pk.	23152	
Front Ferrule	1/16"	103-1	20-pk.	23103		10-pk.	23153	
	1/8"	203-1	40-pk.	23104		20-pk.	23154	
	1/4"	403-1	40-pk.	23105		20-pk.	23155	
Back Ferrule	1/16"	104-1	20-pk.	23106		10-pk.	23156	
	1/8"	204-1	40-pk.	23107		20-pk.	23157	
	1/4"	404-1	40-pk.	23108		20-pk.	23158	
Nut & Ferrule Set	1/16"		10-pk.	23109		2-pk.	23159	
	1/8"		20-pk.	23110		5-pk.	23160	
	1/4"		20-pk.	23111		5-pk.	23161	
Plug	1/16"	100-P	5-pk.	23112		2-pk.	23162	
	1/8"	200-P	10-pk.	23113		4-pk.	23163	
	1/4"	400-P	10-pk.	23114		4-pk.	23164	
Union	1/16"	100-6	3-pk.	23115		ea.	23165	
	1/8"	200-6	5-pk.	23116		2-pk.	23166	
	1/4"	400-6	5-pk.	23117		2-pk.	23167	
Reducing Union	1/8" to 1/16"	200-6-1	5-pk.	23118		ea.	23168	
	1/4" to 1/16"	400-6-1	5-pk.	23119		2-pk.	23169	
	1/4" to 1/8"	400-6-2	5-pk.	23120		2-pk.	23170	
Tee	1/16"	100-3	2-pk.	23121		ea.	23171	
	1/8"	200-3	2-pk.	23122		ea.	23172	
	1/4"	400-3	2-pk.	23123		ea.	23173	
Cross	1/8"	200-4	2-pk.	23124		ea.	23174	
	1/4"	400-4	2-pk.	23125		ea.	23175	
Tube End Reducer	1/8" to 1/16"	100-R-2	5-pk.	23126		2-pk.	23176	
	1/4" to 1/16"	100-R-4	5-pk.	23127		2-pk.	23177	
	1/8" to 1/4"	400-R-2	5-pk.	23128		2-pk.	23178	
	1/4" to 1/8"	200-R-4	5-pk.	23129		2-pk.	23179	
Port Connector	1/8"	201-PC	5-pk.	23130		2-pk.	23180	
	1/4"	401-PC	10-pk.	23131		2-pk.	23181	
	1/8" to 1/4"	401-PC-2	5-pk.	23132		2-pk.	23182	
Male Connector	1/8" to 1/8" NPT	200-1-2	10-pk.	23133		2-pk.	23183	
	1/4" to 1/4" NPT	400-1-4	10-pk.	23134		2-pk.	23184	
	1/16" to 1/8" NPT	100-1-2	5-pk.	23135		2-pk.	23185	
	1/8" to 1/4" NPT	200-1-4	10-pk.	23136		2-pk.	23186	
	1/4" to 1/8" NPT	400-1-2	10-pk.	23137		2-pk.	23187	
Female Connector	1/8" to 1/8" NPT	200-7-2	5-pk.	23138		2-pk.	23188	
	1/4" to 1/4" NPT	400-7-4	5-pk.	23139		2-pk.	23189	
	1/4" to 1/8" NPT	400-7-2	5-pk.	23140		2-pk.	23190	
Male & Female Quick Couplings	1/8" male*	QC4D-200	—	—		ea.	23191	
	1/8" male	QC4S-200	—	—		ea.	23192	
	1/8" female*	QC4B-200	—	—		ea.	23193	
	1/4" male*	QC4D-400	—	—		ea.	23194	
	1/4" male	QC4S-400	—	—		ea.	23195	
	1/4" female*	QC4B-400	—	—		ea.	23196	

\*Includes self-sealing shut-off valve.

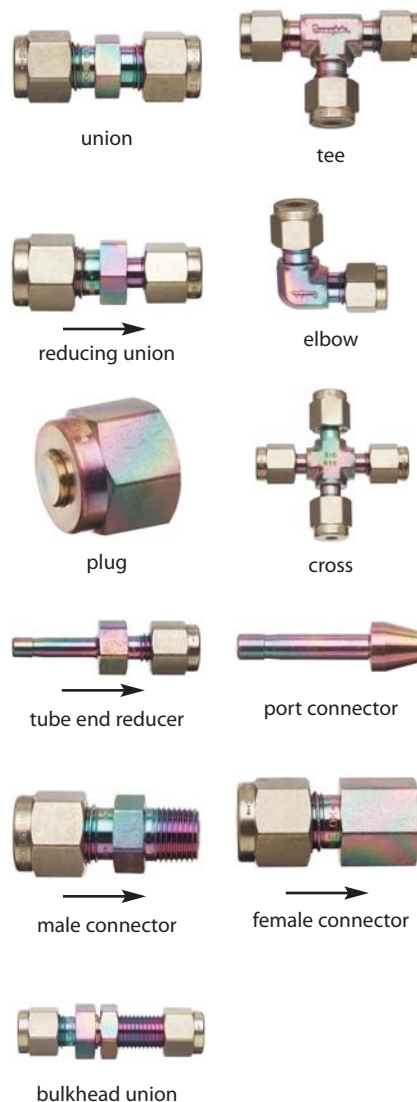
## also available

Restek also carries specialized tools for Swagelok® fittings. See page 325.

**Swagelok® Fittings (Siltek®/Sulfinert® & Silcosteel®-CR Treated)**

- Full line of treated  $1/16$ ",  $1/8$ ", and  $1/4$ " fittings.
- Silcosteel®-CR treatment enhances corrosion resistance by 10x, or more.
- Custom treatment available for any Swagelok® fitting, or other system parts not listed here (call for details).
- Description of custom Restek coatings listed below.

Fitting Type	Size	Swagelok #	Siltek/Sulfinert Treated			Silcosteel-CR Treated		
			qty.	cat.#	price	qty.	cat.#	price
Union	$1/16$ "	SS-100-6	ea.	22540		ea.	22575	
	$1/8$ "	SS-200-6	ea.	22541		ea.	22576	
	$1/4$ "	SS-400-6	ea.	22542		ea.	22577	
	$3/8$ "	SS-600-6	ea.	22909		ea.	22904	
Tee	$1/16$ "	SS-100-3	ea.	22543		ea.	22578	
	$1/8$ "	SS-200-3	ea.	22544		ea.	22579	
	$1/4$ "	SS-400-3	ea.	22545		ea.	22580	
	$3/8$ "	SS-600-3	ea.	22910		ea.	22905	
Reducing Union	$1/8$ " to $1/16$ "	SS-200-6-1	ea.	22546		ea.	22581	
	$1/4$ " to $1/16$ "	SS-400-6-1	ea.	22547		ea.	22582	
	$1/4$ " to $1/8$ "	SS-400-6-2	ea.	22548		ea.	22583	
	$3/8$ " to $1/4$ "	SS-600-6-4	ea.	22911		ea.	22906	
Elbow	$1/8$ "	SS-200-9	ea.	22549		ea.	22584	
	$1/4$ "	SS-400-9	ea.	22550		ea.	22585	
Plug	$1/8$ "	SS-200-P	ea.	22573		ea.	22620	
	$1/4$ "	SS-400-P	ea.	22574		ea.	22597	
Cross	$1/8$ "	SS-200-4	ea.	22551		ea.	22586	
	$1/4$ "	SS-400-4	ea.	22552		ea.	22587	
Tube End Reducer	$1/8$ " tube to $1/16$ "	SS-100-R-2	ea.	22553		ea.	22588	
	$1/4$ " tube to $1/16$ "	SS-100-R-4	ea.	22554		ea.	22589	
	$1/8$ " tube to $1/4$ "	SS-400-R-2	ea.	22555		ea.	22590	
	$1/4$ " tube to $1/8$ "	SS-200-R-4	ea.	22556		ea.	22591	
Port Connector	$1/8$ "	SS-201-PC	ea.	22557		ea.	22592	
	$1/4$ "	SS-401-PC	ea.	22558		ea.	22593	
	$1/8$ " tube to $1/4$ "	SS-401-PC-2	ea.	22559		ea.	22594	
Male Connector	$1/8$ " to $1/8$ " NPT	SS-200-1-2	ea.	22561		ea.	22595	
	$1/4$ " to $1/4$ " NPT	SS-400-1-4	ea.	22562		ea.	22596	
	$1/16$ " to $1/8$ " NPT	SS-100-1-2	ea.	22563		ea.	22610	
	$1/8$ " to $1/4$ " NPT	SS-200-1-4	ea.	22564		ea.	22611	
	$1/4$ " to $1/8$ " NPT	SS-400-1-2	ea.	22565		ea.	22612	
	$3/8$ " to $3/8$ " NPT	SS-600-1-6	ea.	22912		ea.	22907	
Female Connector	$1/8$ " to $1/8$ " NPT	SS-200-7-2	ea.	22566		ea.	22613	
	$1/4$ " to $1/4$ " NPT	SS-400-7-4	ea.	22567		ea.	22614	
	$1/4$ " to $1/8$ " NPT	SS-400-7-2	ea.	22568		ea.	22615	
	$1/8$ " to $1/4$ " NPT	SS-200-7-4	ea.	22569		ea.	22616	
Bulkhead Union	$1/8$ "	SS-200-61	ea.	22570		ea.	22617	
	$1/4$ "	SS-400-61	ea.	22571	\$68	ea.	22618	

**Custom Restek Coatings**

- **Siltek®**—The ultimate passivation of treated surfaces, from glass to high nickel alloys of steel; ideal for sulfurs, automotive exhaust testing, or stack gas sampling.
- **Sulfinert®**—A required treatment for metal components when analyzing for parts-per-billion levels of organo-sulfur compounds.
- **Silcosteel®-CR**—A corrosion resistant layer that increases the lifetime of system components in acidic environments containing hydrochloric acid, nitric acid, or seawater.

For more information on our custom coatings, see page 318.

## Parker® Fittings (Brass &amp; Stainless Steel)

Parker's (A-Lok®) two-piece ferrules and NPT fittings are ideal for installing new equipment, modifying existing instrumentation, or replacing worn connections. Restek offers both brass and stainless steel fittings. If there is a particular Parker® fitting that you are looking for and it is not listed here, please contact us to inquire about availability.



Fitting Type	Size	Parker #	qty.	Brass		316 Grade Stainless Steel		
				cat.#	price	qty.	cat.#	price
Nut	1/16"	1 Nu 1	20-pk.	21800		5-pk.	21900	
	1/8"	2 Nu 2	40-pk.	21801		10-pk.	21901	
	1/4"	4 Nu 4	40-pk.	21802		10-pk.	21902	
Front Ferrule	1/16"	1 FF 1	20-pk.	21803		10-pk.	21903	
	1/8"	2 FF 2	40-pk.	21804		20-pk.	21904	
	1/4"	4 FF 4	40-pk.	21805		20-pk.	21905	
Back Ferrule	1/16"	1 BF 1	20-pk.	21806		10-pk.	21906	
	1/8"	2 BF 2	40-pk.	21807		20-pk.	21907	
	1/4"	4 BF 4	40-pk.	21808		20-pk.	21908	
Nut & Ferrule Set	1/16"	—	10-pk.	21809		2-pk.	21909	
	1/8"	—	20-pk.	21810		5-pk.	21910	
	1/4"	—	20-pk.	21811		5-pk.	21911	
Plug	1/16"	1 BLP 1	5-pk.	21815		2-pk.	21915	
	1/8"	2 BLP 2	10-pk.	21816		4-pk.	21916	
	1/4"	4 BLP 4	10-pk.	21817		4-pk.	21917	
Union	1/16"	1 SC 1	3-pk.	21818		ea.	21918	
	1/8"	2 SC 2	5-pk.	21819		2-pk.	21919	
	1/4"	4 SC 4	5-pk.	21820		2-pk.	21920	
Reducing Union	1/8" to 1/16"	2 RU 1	5-pk.	21823		ea.	21923	
	1/4" to 1/16"	4 RU 1	5-pk.	21824		2-pk.	21924	
	1/4" to 1/8"	4 RU 2	5-pk.	21825		2-pk.	21925	
Tee	1/16"	1 ET 1	2-pk.	21826		ea.	21926	
	1/8"	2 ET 2	2-pk.	21827		ea.	21927	
	1/4"	4 ET 4	2-pk.	21828		ea.	21928	
Cross	1/8"	2 ECR 2	2-pk.	21829		ea.	21929	
	1/4"	4 ECR 4	2-pk.	21830		ea.	21930	
Tube End Reducer	1/8" tube to 1/16"	2 TUR 1	5-pk.	21831		2-pk.	21931	
	1/4" tube to 1/16"	4 TUR 1	5-pk.	21832		2-pk.	21932	
	1/8" tube to 1/4"	2 TUR 4	5-pk.	21833		2-pk.	21933	
	1/4" tube to 1/8"	4 TUR 2	5-pk.	21834		2-pk.	21934	
Port Connector	1/8"	2 PC 2	5-pk.	21835		2-pk.	21935	
	1/4"	4 PC 4	10-pk.	21836		2-pk.	21936	
	1/8" tube to 1/4"	2 PC 4	5-pk.	21837		2-pk.	21937	
Male Connector	1/8" to 1/8" NPT	2 MSC 2N	10-pk.	21841		2-pk.	21941	
	1/4" to 1/4" NPT	4 MSC 4N	10-pk.	21842		2-pk.	21942	
	1/16" to 1/8" NPT	1 MSC 2N	5-pk.	21843		2-pk.	21943	
	1/8" to 1/4" NPT	2 MSC 4N	10-pk.	21844		2-pk.	21944	
	1/4" to 1/8" NPT	4 MSC 2N	10-pk.	21845		2-pk.	21945	
Female Connector	1/8" to 1/8" NPT	2 FSC 2N	5-pk.	21846		2-pk.	21946	
	1/4" to 1/4" NPT	4 FSC 4N	5-pk.	21847		2-pk.	21947	
	1/4" to 1/8" NPT	4 FSC 2N	5-pk.	21848		2-pk.	21948	
Male & Female Quick Couplings	1/8" male*	2A-Q4VN	—	—		ea.	21957	
	1/8" male	2A-Q4P	—	—		ea.	21958	
	1/8" female*	2A-Q4CN	—	—		ea.	21959	
	1/4" male*	4A-Q4VN	—	—		ea.	21960	
	1/4" male	4A-Q4P	—	—		ea.	21961	
	1/4" female*	4A-Q4CN	—	—		ea.	21962	

\*Includes self-sealing shut-off valve.

**Parker® Fittings (Siltek®/Sulfinert® Treated & Silcosteel®-CR Treated)**

A broad line of 1/16", 1/8" and 1/4" fittings are available with Siltek®/Sulfinert® or Silcosteel®-CR treatment. Because of expanding applications for these coatings, we have received many requests for a broader product offering. If you do not see everything you need, contact us for information on custom coating services.

Fitting Type	Size	Parker #	Siltek/Sulfinert Treated			Silcosteel-CR Treated		
			qty.	cat.#	price	qty.	cat.#	price
Union	1/16"	1 SC 1	ea.	22520		ea.	22863	
	1/8"	2 SC 2	ea.	22521		ea.	22864	
	1/4"	4 SC 4	ea.	22522		ea.	22865	
Tee	1/16"	1 ET 1	ea.	22526		ea.	22866	
	1/8"	2 ET 2	ea.	22527		ea.	22867	
	1/4"	4 ET 4	ea.	22528		ea.	22868	
Reducing Union	1/8" to 1/16"	2 RU 1	ea.	22523		ea.	22869	
	1/4" to 1/16"	4 RU 1	ea.	22524		ea.	22870	
	1/4" to 1/8"	4 RU 2	ea.	22525		ea.	22871	
Elbow	1/4"	2 EE 2	ea.	22530		ea.	22875	
	1/4"	4 EE 4	ea.	22531		ea.	22876	
Plug	1/8"	2 BLP 2	ea.	21540		ea.	22878	
	1/4"	4 BLP 4	ea.	21541		ea.	22879	
Cross	1/8"	2 ECR 2	ea.	21542		ea.	22872	
	1/4"	4 ECR 4	ea.	21543		ea.	22873	
Tube End Reducer	1/8" tube to 1/16"	2 TUR 1	ea.	21544		ea.	22880	
	1/4" tube to 1/16"	4 TUR 1	ea.	21545		ea.	22881	
	1/8" tube to 1/4"	2 TUR 4	ea.	21546		ea.	22882	
	1/4" tube to 1/8"	4 TUR 2	ea.	21547		ea.	22883	
Port Connector	1/8"	2 PC 2	ea.	21548		ea.	22884	
	1/4"	4 PC 4	ea.	21549		ea.	22885	
	1/8" tube to 1/4"	2 PC 4	ea.	21550		ea.	22886	
Male Connector	1/8" to 1/8" NPT	2 MSC 2N	ea.	21551		ea.	22887	
	1/4" to 1/4" NPT	4 MSC 4N	ea.	21552		—	—	
	1/16" to 1/8" NPT	1 MSC 2N	ea.	21553		ea.	22889	
	1/8" to 1/4" NPT	2 MSC 4N	ea.	21554		ea.	22890	
	1/4" to 1/8" NPT	4 MSC 2N	ea.	21555		ea.	22891	
Female Connector	1/8" to 1/8" NPT	2 FSC 2N	ea.	21556		ea.	22892	
	1/4" to 1/4" NPT	4 FSC 4N	ea.	21557		ea.	22893	
	1/4" to 1/8" NPT	4 FSC 2N	ea.	21558		ea.	22894	
	1/8" to 1/4" NPT	2 FSC 4N	ea.	21559		—	—	
Plug Valve, 2-Way	1/8"	2A PR4 VT SS	ea.	21586		—	—	
	1/4"	4A PR4 VT SS	ea.	21587		—	—	
Ball Valve, 2-Way	1/8"	2A B2LJ2 SSP	ea.	21588		—	—	
	1/4"	4A B2LJ2 SSP	ea.	21589		—	—	

Please note: Nuts and ferrules are not treated unless requested (custom parts). Nuts and ferrules normally are not in contact with sample pathway, and thus do not require coating.

Ball and plug valves are also available in brass and stainless steel. See **page 322**.



union



tee



reducing union



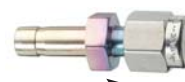
elbow



plug



cross



tube end reducer



port connector



male connector



female connector



plug valve, 2-way



ball valve, 2-way

**Valco® Fittings (Siltek®/Sulfinert® Treated)**

Fitting Type	Size	Siltek/Sulfinert Treated		
		qty.	cat.#	price
Zero Dead Volume Tee	1/16"	ea.	22534	
	1/8"	ea.	22535	
Zero Dead Volume Union	1/16"	ea.	22532	
	1/8"	ea.	22533	

zero dead volume  
teezero dead volume  
union

## Tubing



### Tubing and Available Coatings

Restek sets the standard in tubing for analytical and process applications. Complete your system with precleaned or treated tubing and treated fittings and valves for an inert, corrosion-resistant pathway.

Available tubing coatings include:

- **Siltek®**—The ultimate passivation of treated surfaces, from glass to high nickel alloys of steel; ideal for sulfurs, automotive exhaust testing or stack gas sampling.
- **Silcosteel®-CR**—A corrosion resistant layer that increases the lifetime of system components in acidic environments containing hydrochloric acid, nitric acid, or seawater.
- **Sulfinert®**—A required treatment for metal components when analyzing for parts-per-billion levels of organo-sulfur compounds.

### Frequently Asked Questions

#### 1. Can treated tubing be bent?

Treated tubing can be bent into curves with a bend radius greater than 1 inch for 1/16-inch OD tubing, 2 inches for 1/8-inch OD tubing, or 4 inches for 1/4-inch OD tubing. The treatment layer will remain intact as long as the tubing isn't stretched dramatically. If tight bends are necessary, use a treated elbow union or bend untreated tubing and send it to Restek for custom treatment.

#### 2. Can compression fittings be used without crushing the treatment layer?

Yes. The layer is thin and permeates the surface. It compresses with minimal damage.

#### 3. Is welding possible after treatment?

Yes. The coating does not interfere with the welding of two coated components. The coating is lost at the weld and in the heat affected zones approximately 2 to 5 mm on either side of the weld.

#### 4. Is any additional chemical deactivation necessary?

A Sulfinert® or Silcosteel® layer leaves few exposed active sites, so there usually is no need for additional treatment. Chemical deactivation is useful in chromatographic applications in which water will be vaporized on the Silcosteel® treated surface, but is not necessary for Sulfinert® treated surfaces. Parts used in high-temperature applications (>400 °C) cannot be chemically deactivated.

#### 5. What are the temperature constraints of these surface treatments?

On stainless steel, a Silcosteel® layer is stable to 600 °C. Parts treated with a secondary polymeric layer are limited to temperatures of 400 °C in inert atmospheres and 250 °C when oxygen is present, the temperature maximums for the polymer. Temperatures above 600 °C can be used under certain conditions—please contact us for information.

#### 6. Why use Sulfinert® or Silcosteel® treatment instead of Teflon® coating?

Three reasons: 1) Sulfinert® and Silcosteel® layers are nonpolymeric, so they do not exhibit the problems associated with gas permeability. 2) Teflon® coating often flakes off the surface, while the Sulfinert® or Silcosteel® layer is tightly integrated into the substrate lattice. 3) Teflon® coating is limited to 280 °C, while Silcosteel® treated stainless steel tubing and fittings can be used to 600 °C.

#### 7. Why use Siltek®/Sulfinert® treated tubing for transfer lines?

Siltek®/Sulfinert® treated stainless steel tubing offers all of the advantages of glass or fused silica tubing for the transfer of active compounds (e.g., sulfurs), but is far more durable and flexible.

#### 8. Is treated tubing similar to glass-lined tubing (GLT)?

No. Sulfinert® or Silcosteel® treated tubing is flexible and can be bent without heating. Also, the Sulfinert® or Silcosteel® layer is highly inert, unlike impure glass.

#### 9. How can I clean the surface of a treated part after use?

Most often, a mild organic solvent (methylene chloride, methanol, hexane) or water is sufficient. Mild sonication may assist and accelerate the process. Do not use caustic, abrasive, or high pH (pH>8) cleaners, as they will damage or dissolve the layer. Steam cleaning in the presence of oxygen or air could create surface activity, and also should be avoided.

#### 10. What materials should I avoid using with Silcosteel® treated parts?

The Silcosteel® coating is silicon-based and is prone to attack by hydrofluoric acid or by basic compounds. The surface should not be exposed to media with pH>8.

#### 11. Siltek® and Sulfinert®: What's the Difference?

Siltek® is the name for the patented deposition process. When the Siltek® process was developed, the application that showed the greatest benefit was the storage and transfer of low ppb level active sulfur compounds, such as hydrogen sulfide and mercaptans. Because there was (and continues to be) demand for a reliable surface treatment for this application, the name Sulfinert® is used to describe Siltek® treated products created specifically for this purpose.

## Instrument-Grade Welded and Drawn 304 Grade Stainless Steel Tubing

Clean tubing is critical to ensure the delivery of pure gas to your instrument. Restek's stainless steel tubing is cleaned specifically for inertness using the procedure for processing Silcosteel® and Siltek®-treated products, because scrupulously clean parts are a prerequisite for a quality coating. This ensures you are getting quality tubing for your chromatography system.

Tubing Dimensions		25 Feet		Length (per-foot pricing on 26 feet or more)			
ID (in.)	OD (in.)	cat.#	price	cat.#	price	cat.#	price
0.01"	1/16"	21500	\$67	21501		21502	
0.02"	1/16"	21503	\$67	21504		21505	
0.03"	1/16"	21506	\$67	21507		21508	
0.04"	1/16"	21509	\$67	21510		21511	
0.085"	1/8"	21512	\$60	21513		21514	
0.21"	1/4"	21515	\$72.50	21516		21517	

\*The availability of long lengths (continuous lengths up to 500 feet) is subject to inventory constraints. Please inquire before ordering.



## ordering note

Required length in meters x 3.2808 = length in feet.

An extra charge is applied for cutting and/or straightening stainless steel and/or copper tubing, calculated from the total number of pieces produced for each line item:

# of Pieces	Added Charge
5 to 15	0
16 to 30	
31 to 75	
76 to 99	
100 to 200	

## Precleaned Copper Tubing

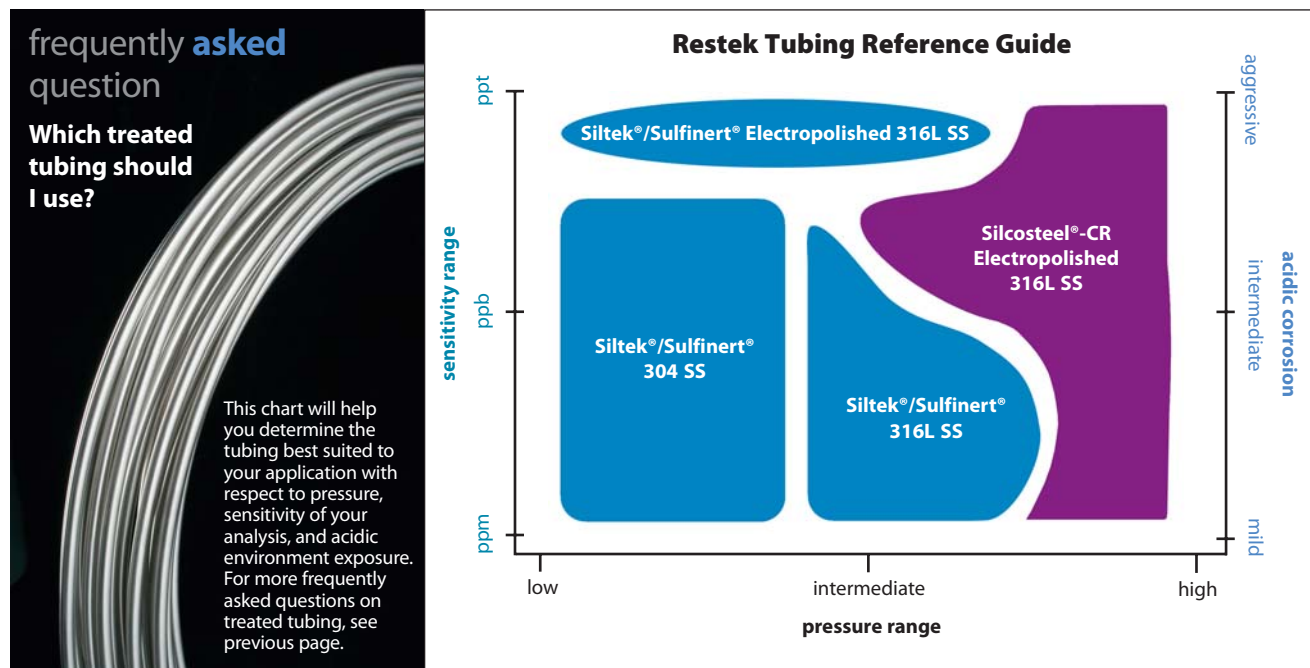
- Adheres to ASTM B-280.
- Precleaned and ready to use.
- Use for plumbing GC systems.

ID	OD	Wall	qty.	cat.#	price
0.065"	1/8"	0.030"	50 ft.	21590	
0.190"	1/4"	0.030"	50 ft.	21592	



## Plumbing a GC

It is essential to use clean chromatographic-grade tubing to plumb a GC. Standard-grade tubing contains residual hydrocarbon contaminants from the drawing process. These contaminants migrate into the carrier gas stream, elevating background noise and causing down time.



## Tubing

did you **know?**

A smoother internal surface is less adsorptive.



Top: electropolished finish, surface roughness average number: 10-15.

Bottom: conventional finish, surface roughness average number: approx. 23-27.

An extra charge is applied for cutting Siltek®/Sulfinert® or Silcosteel®-CR tubing. The charge is calculated from the total number of pieces produced for each line item:

# of Pieces	Added Charge
5 to 15	\$50
16 to 30	\$100
31 to 75	\$150
76 to 99	\$200
100 to 200	\$250

## Minimum Bend Radius for Coated Tubing

OD	Min. Bend Radius
≤ 1/16"	1" (2.5 cm)
1/8"	2" (5.1 cm)
1/4"	4" (10.2 cm)
3/8"	6" (15.2 cm)

did you **know?**

Other lengths and diameters of treated tubing are available on a custom basis.

Call for availability of lengths greater than 1,000 ft.

ordering **note**

Required length in meters x 3.2808 = length in feet.

## Treated Seamless Electropolished 316L Grade Stainless Steel Tubing

Our highest performing tubing. Recommended for:

- demanding/corrosive environments.
- high temperatures.
- ultimate inertness.

## Siltek®/Sulfinert Treated (Coiled)

OD	ID	Wall Thickness	cat.#	Price-per-foot			
				5-24 ft.	25-99 ft.	100-299 ft.	> 300 ft.
1/8" (3.18mm)	0.085" (2.16mm)	0.020"	22538				
1/4" (6.35mm)	0.180" (4.57mm)	0.035"	22539				

## Silcosteel®-CR Treated (Coiled)

OD	ID	Wall Thickness	cat.#	Price-per-foot			
				5-24 ft.	25-99 ft.	100-299 ft.	> 300 ft.
1/8" (3.18mm)	0.085" (2.16mm)	0.020"	22536				
1/4" (6.35mm)	0.180" (4.57mm)	0.035"	22537				

1/8" OD: 5 ft. to 95 ft. in one continuous coil; 1/4" OD: 5 ft. to 300 ft. in one continuous coil. Longer lengths will be more than one coil.

## Treated Welded/Drawn 304 Grade Stainless Steel Tubing

Our most popular grade of tubing. Recommended for:

- chromatography applications.
- gas delivery systems.
- lower pressures.
- inert applications.

## Siltek®/Sulfinert® Treated (Coiled)

OD	ID	Wall Thickness	cat.#	Price-per-foot			
				5-24 ft.	25-199 ft.	200-399 ft.	> 400 ft.
0.022" (0.56mm)	0.011" (0.28mm)		22500				
0.029" (0.74mm)	0.021" (0.53mm)		22501				
1/16" (1.59mm)	0.010" (0.25mm)		22502				
1/16" (1.59mm)	0.020" (0.51mm)		22503				
1/16" (1.59mm)	0.030" (0.76mm)		22504				
1/16" (1.59mm)	0.040" (1.02mm)		22505				
1/8" (3.18mm)	0.085" (2.16mm)	0.020"	22506				
1/4" (6.35mm)	0.210" (5.33mm)	0.020"	22507				

## Treated Seamless 316L Grade Stainless Steel Tubing

High durability tubing. Recommended for:

- inert applications.
- high temperatures.
- high pressures.
- corrosive environments.
- zero bleed.

## Siltek®/Sulfinert® Treated (Coiled)

OD	ID	Wall Thickness	cat.#	Price-per-foot			
				5-24 ft.	25-199 ft.	200-399 ft.	> 400 ft.
1/8" (3.18mm)	0.055" (1.40mm)	0.035"	22508				
1/4" (6.35mm)	0.180" (4.57mm)	0.035"	22509				
3/8" (9.52mm)	0.277" (7.04mm)	0.049"	22914				

## Silcosteel®-CR Treated (Coiled)

OD	ID	Wall Thickness	cat.#	Price-per-foot			
				5-24 ft.	25-199 ft.	200-399 ft.	> 400 ft.
1/8" (3.18mm)	0.055" (1.40mm)	0.035"	22896				
1/4" (6.35mm)	0.180" (4.57mm)	0.035"	22897				
3/8" (9.52mm)	0.277" (7.04mm)	0.049"	22915				

## Treated Straight, 6-Foot Length Stainless Steel Tubing

Individual 6-foot ( $\pm 1/2$ " ) straight pieces.

In response to customer requests, we offer 6-foot straight lengths of  $1/8$ -,  $1/4$ -, and  $3/8$ -inch treated tubing. This tubing can be cut to your exact requirements using a standard tubing cutter.

### Siltek®/Sulfinert® Treated, 316L Grade

OD	ID	Wall Thickness	qty.	cat.#	price
$1/8$ " (3.18mm)	0.055" (1.40mm)	0.035"	ea.	22901	
$1/4$ " (6.35mm)	0.180" (4.57mm)	0.035"	ea.	22902	
$3/8$ " (9.52mm)	0.277" (7.04mm)	0.049"	ea.	22903	

### Silcosteel®-CR Treated, 316L Grade

OD	ID	Wall Thickness	qty.	cat.#	price
$1/8$ " (3.18mm)	0.055" (1.40mm)	0.035"	ea.	22898	
$1/4$ " (6.35mm)	0.180" (4.57mm)	0.035"	ea.	22899	
$3/8$ " (9.52mm)	0.277" (7.04mm)	0.049"	ea.	22900	

## Treated Hydroguard® Deactivated Stainless Steel Tubing

Hydroguard® deactivation creates a high-density surface that is not readily attacked by aggressive hydrolysis.

### Silcosteel® Treated, 304 Grade

OD	ID	Wall Thickness	cat.#	Price-per-foot			
				5-24 ft.	25-199 ft.	200-399 ft.	> 400 ft.
$1/16$ " (1.59mm)	0.010" (0.25mm)		22497				
$1/16$ " (1.59mm)	0.020" (0.51mm)		22496				
$1/16$ " (1.59mm)	0.030" (0.76mm)		22495				
$1/16$ " (1.59mm)	0.040" (1.02mm)		22494				
$1/8$ " (3.18mm)	0.085" (2.16mm)	0.020"	22493				
$1/4$ " (6.35mm)	0.210" (5.33mm)	0.020"	22492				

### Silcosteel® Treated, Seamless 316L Grade

OD	ID	Wall Thickness	cat.#	Price-per-foot			
				5-24 ft.	25-199 ft.	200-399 ft.	> 400 ft.
$1/8$ " (3.18mm)	0.055" (1.40mm)	0.035"	22491				
$1/4$ " (6.35mm)	0.180" (4.57mm)	0.035"	22490				

### Silcosteel® Treated, Electropolished 316L Grade

OD	ID	Wall Thickness	cat.#	Price-per-foot			
				5-24 ft.	25-99 ft.	100-299 ft.	> 300 ft.
$1/8$ " (3.18mm)	0.085" (2.16mm)	0.020"	22489				
$1/4$ " (6.35mm)	0.180" (4.57mm)	0.035"	22488				

Siltek®/Sulfinert® treated tubing is recommended for purge & trap and headspace systems



An extra charge is applied for cutting Siltek®/Sulfinert®, Silcosteel®, or Silcosteel®-CR tubing. The charge is calculated from the total number of pieces produced for each line item:

# of Pieces	Added Charge
5 to 15	
16 to 30	
31 to 75	
76 to 99	
100 to 200	

**Shut-Off Gas Valves**  
Swagelok®



	$\frac{1}{8}$ " Brass		$\frac{1}{4}$ " Brass		$\frac{1}{8}$ " Stainless Steel		$\frac{1}{4}$ " Stainless Steel	
Valve Type	cat.#	ea.	cat.#	ea.	cat.#	ea.	cat.#	ea.
Toggle	23142		23143		23198		23199	
Ball	23144		23145		23200		23201	
Plug	23146		23147		23202		23203	

**Metering Gas Valves**  
Swagelok®



23206

Description	qty.	cat.#	price
$\frac{1}{8}$ " Brass			
Metering Valve, straight	ea.	23148	
$\frac{1}{4}$ " Brass			
Metering Valve, straight	ea.	23149	
$\frac{1}{8}$ " Stainless Steel			
Metering Valve, straight	ea.	23204	\$240
$\frac{1}{4}$ " Stainless Steel			
Metering Valve, straight	ea.	23205	
Vernier Knob for Metering Valve	ea.	23206	\$40



23148

**Shut-Off Gas Valves**  
Parker Balston®



	$\frac{1}{8}$ " Brass		$\frac{1}{4}$ " Brass		$\frac{1}{8}$ " Stainless Steel		$\frac{1}{4}$ " Stainless Steel	
Valve Type	cat.#	ea.	cat.#	ea.	cat.#	ea.	cat.#	ea.
Toggle	22188		22189		22190		22191	
Ball	22192		22193		22194		22195	
Plug	22196	\$61	22197		22198		22199	

Parker Balston ball and plug valves are also available treated. See **page 317**.

**Metering Gas Valves**  
Parker Balston®



22209

Description	qty.	cat.#	price
$\frac{1}{8}$ " Nickel-Plated Brass			
Metering, straight	ea.	22200	
$\frac{1}{4}$ " Nickel-Plated Brass			
Metering, straight	ea.	22201	
$\frac{1}{8}$ " Stainless Steel			
Metering, straight	ea.	22204	
$\frac{1}{4}$ " Stainless Steel			
Metering, straight	ea.	22205	
Vernier Knob for Metering Valve	ea.	22209	



22200



**VCO® O-Ring Face Seal Fittings**  
Swagelok®

- Unique design allows easy installation where space is limited.
- Assemblies can be used from high pressure to critical vacuum, across a wide range of temperatures.
- Smooth finish on gland face ensures positive seal.
- Sealing is accomplished with a captive O-ring in the body component.



Swagelok® VCO® O-ring face seal fittings are designed for rapid assembly in pipe, tube, and welded systems.



**Specifications:**

Pressure Ratings	Up to 15,400 psig (1061 bar)
Temperature Ratings	Up to 400 °F (204 °C)

Description	Material	qty.	cat.#	price
$\frac{1}{4}$ " VCO to $\frac{1}{4}$ " Tube Adaptor	Stainless Steel	2-pk.	23207	
$\frac{1}{4}$ " VCO to $\frac{1}{4}$ " Tube Adaptor	Siltek Treated	2-pk.	23209	
$\frac{1}{4}$ " VCO to $\frac{1}{4}$ " Tube Fitting	Stainless Steel	2-pk.	23210	
$\frac{1}{2}$ " VCO to $\frac{1}{4}$ " Tube Fitting	Siltek Treated	ea.	23211	
$\frac{1}{4}$ " VCO to $\frac{1}{8}$ " Tube Fitting	Stainless Steel	2-pk.	23215	
$\frac{1}{4}$ " VCO to $\frac{1}{8}$ " Tube Fitting	Siltek Treated	ea.	23216	
$\frac{1}{2}$ " VCO Nut	Stainless Steel	2-pk.	23212	
$\frac{1}{4}$ " VCO Nut Blind	Stainless Steel	2-pk.	23213	
$\frac{1}{4}$ " VCO Body Blind	Stainless Steel	2-pk.	23214	
Replacement O-Ring, 70 Durometer Fluorocarbon FKM, VCO $\frac{1}{4}$ ", Size 010		10-pk.	23208	

Gap inspection gauge available on **page 325**.



21325

### GC Installation Kit

This kit contains the tubing and fittings needed to add an additional GC to your lab bench. Kit includes: tubing cutter, one 1/8-inch x 1/4-inch reamer, one 1/4-inch x 1/8-inch brass tube end reducer, one 7/16-inch wrench, one 1/2-inch wrench, four 1/8-inch brass tees, ten 1/8-inch brass nuts, ten brass front and back ferrules, and 50 feet (15.2 meters) of our instrument-grade cleaned 1/8-inch copper tubing.

Description	qty.	cat.#	price
GC Installation Kit	kit	21325	



23004

### 54-Piece Tool Kit

Set comes with screwdrivers, pliers, wrenches, sockets, scissors, clamps, and more. Durable, zippered, notebook-style carrying case for easy transport.

Description	qty.	cat.#	price
Tool Kit	kit	23004	

### Plier Set

Includes 6-inch nose/side cutter, 6-inch wire cutter, and 6-inch adjusting pliers.



Description	qty.	cat.#	price
Plier Set	set	23033	



22999

### Metric 9 Piece Ball-Point Hex Key Set

Includes 9 metric hex keys (Allen wrenches): 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10 mm.

Description	qty.	cat.#	price
Metric 9 Piece Ball-Point Hex Key Set	set	22999	



22998

### 12 Piece Ball-Point Hex Key Set

Includes 12 hex keys (Allen wrenches): 0.050", 1/16", 5/64", 3/32", 7/64", 1/8", 9/64", 5/32", 3/16", 7/32", 1/4", and 5/16".

Description	qty.	cat.#	price
12 Piece Ball-Point Hex Key Set	set	22998	

### Torx® Screwdriver Set

- Set includes TR-10, TR-15, and TR-20.
- Ideal for performing routine maintenance on Agilent 6890 and 7890 GCs.



Description	qty.	cat.#	price
Torx Screwdriver Set	set	23034	



23002

### 5-in-1 Magnetic Screwdriver

Magnetic power tip holds bits and screws securely.

Description	qty.	cat.#	price
5-in-1 Magnetic Screwdriver	set	23002	



23001

### Wrench Set

Includes 4-inch, 6-inch, and 8-inch adjustable wrenches.

Description	qty.	cat.#	price
Wrench Set	set	23001	



20192

### 1/16-Inch Tubing Cutter

- Produces square, smooth cuts in 1/16-inch tubing.
- Eliminates tubing distortion.
- Replaceable cutting wheel.

Description	qty.	cat. #	price
1/16" Tubing Cutter	ea.	20192	
Replacement Cutting Wheels	3-pk.	20185	



### Ridgid® Tubing Cutter

- Excellent for cutting 1/8- or 1/4-inch metal tubing.\*
- Compact size is ideal for tight spaces.
- Replaceable cutting wheel.

Description	qty.	cat. #	price
Ridgid Tubing Cutter for 1/8" or 1/4" metal tubing	ea.	23011	
Replacement Cutting Wheels	2-pk.	23012	

\*Not for use with stainless steel tubing.



22621

### Ridgid® Heavy-Duty Tubing Cutter

- Specifically designed to cut 3/16-1 1/8" stainless steel tubing.
- Large knob and 6 individual bearings for more control with less turning.
- Convenient fold-away reamer.

Description	qty.	cat. #	price
Ridgid Heavy-Duty Tubing Cutter	ea.	22621	



20193

### 1/16-Inch Tubing Cutting Pliers

- Ideal for cutting 1/16-inch tubing.
- Cuts quickly, reducing distortion.
- Cuts clean, eliminating need for deburring.

Description	qty.	cat. #	price
1/16" Tubing Cutting Pliers	ea.	20193	



23029



Dimensions: 8" x 6 1/2" x 4 1/4"  
 (20.3 x 15.9 x 10.8 cm)  
 Weight: 11 lbs. (5.0 kg)

### SSi TC-20 Tube Cutting Machine

- Cuts 1/16", 1/8", or 1/4" tubing with inside diameter as small as 0.008".
- Electrically operated bench-top model.
- Handy dressing tool on the swing arm removes burrs and reams tubing.
- Voltage selectable 110–120/220–240 volts, 50–60 Hz.\*

Description	qty.	cat. #	price
SSi Tubing Cutter Machine	ea.	23029	
SSi Replacement Cutting Wheels	3-pk.	23030	

\*Unit shipped set for 110–120 operating voltage. Switch to 220–240 volts by using alternate fuse and power cord (included).

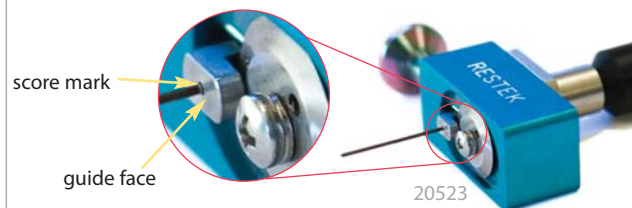
### Restek Tubing Scorer

for MXT® Columns

- Makes perfect cuts every time.
- Easy to use.
- Leaves column entrance perfectly round.

Metal MXT® columns are easy to cut. Scoring wafers can be used, but may leave the column end irregularly shaped. The Restek tubing scorer is designed to make a perfect cut every time, leaving the column entrance perfectly round.

Enlarged view—score mark flush with guide face.



20523

Description	qty.	cat. #	price
Restek Tubing Scorer for MXT Columns (0.25-0.53mm ID & 0.5-0.8mm OD)	ea.	20523	
Replacement Scoring Wheel	ea.	20522	



20188

### Tubing Burring & Reaming Tool

Removes burrs and reams tubing.

Description	Size	qty.	cat.#	price
Tubing Dressing Tool	1/16"	ea.	20188	
Replacement Insert	for 1/16" Tubing Dressing Tool	ea.	20189	
Tubing Dressing Tool	1/8"	ea.	20190	
Replacement Insert	for 1/8" Tubing Dressing Tool	ea.	20191	



22627

### Flexible Inspection Light

- Inspect inside surfaces of sample cylinders or other chambers.
- 14" reach.
- 100,000-hour LED life.

Description	qty.	cat.#	price
Flexible Inspection Light	ea.	22627	



20134

### Tubing Reamer

- Removes burrs from stainless steel tubing.
- For 1/4- or 1/8-inch tubing.
- Nonslip safety design.

Description	qty.	cat.#	price
Tubing Reamer	ea.	20134	



22622

### Swaging Tool

- Preswage compression fittings for easy installation.
- Ideal for installations in tight areas.
- For Swagelok® fittings only.

Description	qty.	cat.#	price
Swaging Tool	ea.	22622	



23009

### Tubing Bender

- Bends 1/8-inch, 3/16-inch, or 1/4-inch tubing.
- Assists in making accurate left-hand, right-hand, or offset bends.

Description	qty.	cat.#	price
Tubing Bender	ea.	23009	



22623

### Tee Wrench

- Hold 1/4" or 6 mm tee or cross fittings secure in multiple orientations during installation.
- Fits easily in tool box, pouch, or belt.
- Cushioned vinyl grip with generous gripping area.
- For Swagelok® fittings only.

Description	qty.	cat.#	price
Tee Wrench	ea.	22623	

### ResTape Teflon® Tape

- For threaded connections in a wide range of plumbing materials.
- Each roll is 1/2" x 260".
- Maximum temperature: 260 °C.



Description	Color	Uses	qty.	cat.#	price
ResTape	Green PTFE	oxygen service*	ea.	22485	
ResTape	Yellow PTFE	general gas service**	ea.	22486	
ResTape	Grey PTFE	stainless steel fittings***	ea.	22487	

\*Compatible with gaseous or liquid oxygen, and with many other gases and liquids.

\*\*Compatible with a broad range of gases and liquids.

\*\*\*Anti-galling. Also compatible with many other metals and polymers.



22624

### Gap Inspection Gauge

- Confirm that fittings are sufficiently tightened.
- For use with 1/4", 3/8", 1/2" Swagelok® fittings.
- For Swagelok® fittings in new installations only.

Description	qty.	cat.#	price
Gap Inspection Gauge	ea.	22624	