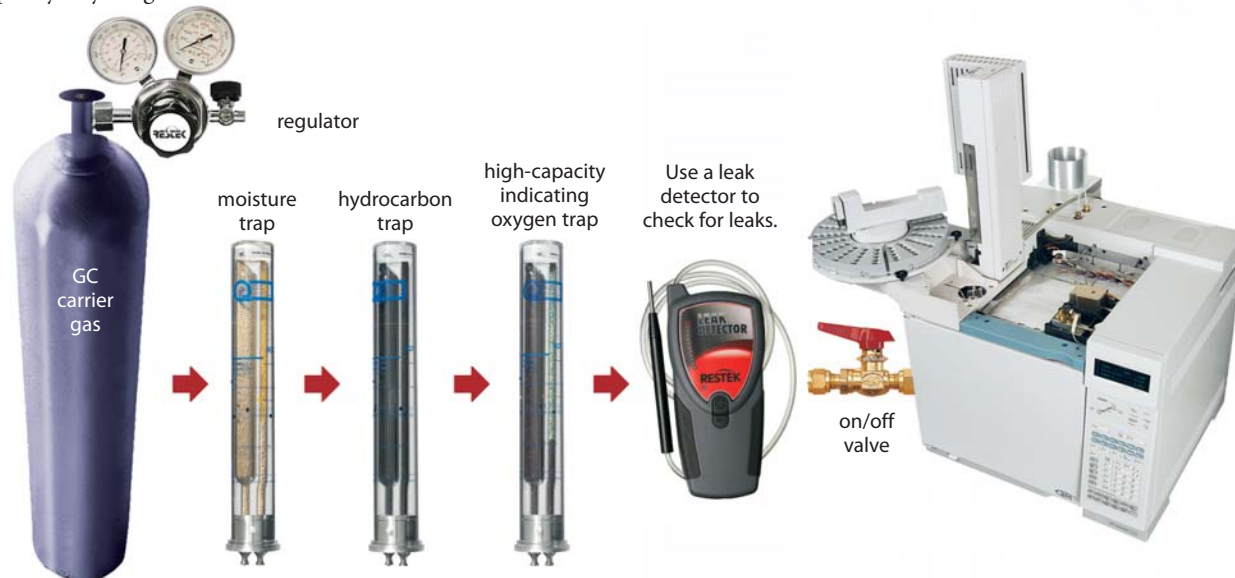




**Restek provides the following total gas system solution:**

- 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?**

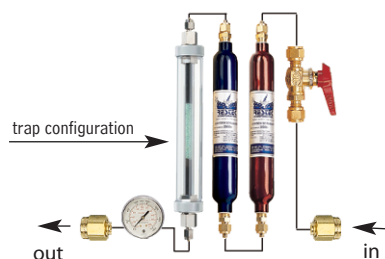
Call 800-356-1688 or 814-353-1300, ext. 4, or contact your Restek representative to discuss your application with our technical service chemists.

**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.



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

**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.# |
|----------------------------------|--|------|-------|
| Restek Gas Management System     | includes fittings for 1/8" and 1/4" gas line | kit  | 21999 |
| Replacement Traps                |  |      |       |
| 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.#   |
|--|------|---------|
| 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   |



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.

**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<sup>1</sup>/<sub>4</sub>" 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.# |
|---|--|------|-------|
| High-Capacity Indicating Oxygen Trap  | <sup>1</sup> / <sub>8</sub> " Compression Tube Brass | ea.  | 20624 |
| High-Capacity Indicating Oxygen Trap  | <sup>1</sup> / <sub>4</sub> " Compression Tube Brass | ea.  | 20623 |
| Replacement Cartridge (fits <sup>1</sup> / <sub>4</sub> " or <sup>1</sup> / <sub>8</sub> " housing) |  | ea.  | 20625 |
| Replacement O-Rings (5 small O-rings and 5 large O-rings)   |  | kit  | 22081 |

Dimensions: 10" x 1<sup>1</sup>/<sub>4</sub>" (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.# |
|------------------------|-------------------------------------|------|-------|
| Indicating Oxygen Trap | <sup>1</sup> / <sub>8</sub> " Brass | ea.  | 22010 |
| Indicating Oxygen Trap | <sup>1</sup> / <sub>4</sub> " Brass | ea.  | 22011 |

Dimensions: 11" x 1<sup>1</sup>/<sub>2</sub>" (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.# |
|---------------------------|---|------|-------|
| High-Capacity Oxygen Trap | <sup>1</sup> / <sub>8</sub> " Nickel-Plated Brass | ea.  | 20601 |
| High-Capacity Oxygen Trap | <sup>1</sup> / <sub>4</sub> " 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<sup>3</sup>/<sub>4</sub>" x 5<sup>5</sup>/<sub>8</sub>" (17.1 x 14.3 cm)

| Description                         | Fittings                            | qty. | cat.# |
|-------------------------------------|-------------------------------------|------|-------|
| Rechargeable Molecular Sieve S-Trap | <sup>1</sup> / <sub>8</sub> " Brass | ea.  | 20686 |
| Rechargeable Molecular Sieve S-Trap | <sup>1</sup> / <sub>4</sub> " Brass | ea.  | 20685 |

Dimensions: 11" x 1<sup>1</sup>/<sub>2</sub>" (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.# |
|-----------------------------|---|------|-------|
| High-Capacity Moisture Trap | <sup>1</sup> / <sub>8</sub> " Nickel-Plated Brass | ea.  | 21997 |
| High-Capacity Moisture Trap | <sup>1</sup> / <sub>4</sub> " 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.# |
|--------------------------|-------------------------------------|------|-------|
| Indicating Moisture Trap | <sup>1</sup> / <sub>8</sub> " Brass | ea.  | 22014 |
| Indicating Moisture Trap | <sup>1</sup> / <sub>4</sub> " Brass | ea.  | 22015 |

## Gas Traps



Dimensions: 11" x 1½" (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.# |
|----------------------------------|--------------------------|------|-------|
| Capillary-Grade Hydrocarbon Trap | 1/8" Nickel-Plated Brass | ea.  | 21991 |
| Capillary-Grade Hydrocarbon Trap | 1/4" Nickel-Plated Brass | ea.  | 21992 |



Dimensions: 9¼" x 2¼" (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.# |
|-------------------------------|--------------------------|------|-------|
| 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: 6¾" x 5½" (17.1 x 14.3 cm)

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



Dimensions: 6" x 1¾" (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.# |
|---|------------|------|-------|
| 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.# |
|-------------------------------|----------|-------|-------|
| 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.# |
|---------------|----------|------|-------|
| 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>3</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<br>159 psi/<br>7 L/min.       | Inert carrier gas<br>Air<br>Hydrogen | Yellow/orange to clear                  | 7.2                  | —                   | —                | >2                         |
| Oxygen cat.# 22029                       | >99.9999               | 11 bar<br>159 psi/<br>7 L/min.       | Inert carrier gas                    | Green to grey                           | NA                   | 1,000               | —                | >2                         |
| Hydrocarbons cat.# 22030                 | >99.9999               | 11 bar<br>159 psi/<br>7 L/min.       | Inert carrier gas<br>Air<br>Hydrogen | No indicator                            | NA                   | —                   | 12 <sup>1</sup>  | >2                         |
| Fuel Gas <sup>1</sup> cat.# 22022        | >99.9999               | 11 bar<br>159 psi/<br>7 L/min.       | Inert carrier gas<br>Air<br>Hydrogen | Yellow/orange to clear                  | 3.5                  | —                   | 24 <sup>3</sup>  | >1.5                       |
| Triple <sup>2</sup> cat.# 22020          | >99.9999               | 11 bar<br>159 psi/<br>7 L/min.       | Inert carrier gas                    | Yellow/orange to clear<br>Green to grey | 1.8                  | 500                 | 4 <sup>3</sup>   | >1                         |
| Helium Specific <sup>2</sup> cat.# 21982 | >99.9999               | 11 bar<br>159 psi/<br>7 L/min.       | Helium                               | Yellow/orange to clear<br>Green to grey | 1.8                  | 500                 | —                | >1                         |

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

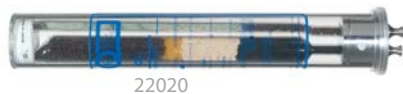
<sup>2</sup>Removes hydrocarbons, moisture, oxygen.

<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.# |
|---|------|-------|
| 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.

# Super-Clean Gas Filters



### 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.# | qty. | cat.#           |  |
| Filter Base Plate, Single-Position | ea.  | 22025 | ea.  | 22344           |  |
| Filter Base Plate, 2-Position      | ea.  | 22026 | ea.  | 22345           |  |
| Filter Base Plate, 3-Position      | ea.  | 22027 | 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.# |
|---|------|-------|
| 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.# |
|---|--------|-------|
| 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.



| Description                         | qty.  | Brass |       | Stainless Steel |  |
|-------------------------------------|-------|-------|-------|-----------------|--|
|                                     |       | cat.# | qty.  | cat.#           |  |
| Tube-End Reducer, 1/8" tube to 1/4" | 5-pk. | 21833 | 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.# |
|---|-------|-------|
| 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, 1/4" or 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<br>160 psi | 25                    | Inert carrier gas, helium, air, H <sub>2</sub> | 15                   | NA                           | NA                                   | >3                         |
| Oxygen cat.#22468                | >99.9999              | 11 bar<br>160 psi | 25                    | Inert carrier gas                              | NA                   | 2,000                        | NA                                   | >3                         |
| Hydrocarbon cat.#22466           | >99.9999              | 11 bar<br>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<br>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<br>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:  
8 1/2" x 1 1/4" (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.



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

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

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



# Super-Clean Gas Filters



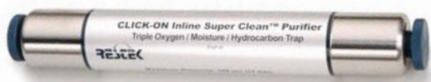
## Click-On Inline Super-Clean Indicator

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

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

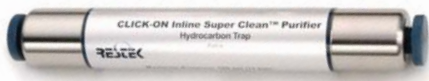


Install an indicator after the Click-On inline gas filter so there is no confusion about when to replace the traps.



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

| Description   | qty. | cat.# |
|---|------|-------|
| 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.# |
|--------------------------------------|------|-------|
| 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.# |
|--|----------------|-------|-------|
| Click-On Inline Super-Clean Connectors | 1/8" Brass     | 2-pk. | 22475 |
| Click-On Inline Super-Clean Connectors | 1/8" Stainless | 2-pk. | 22476 |
| Click-On Inline Super-Clean Connectors | 1/4" Brass     | 2-pk. | 22477 |
| Click-On Inline Super-Clean Connectors | 1/4" Stainless | 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.# |
|---|------|-------|
| Click-On Inline Super-Clean Double Connector, Stainless Steel | ea.  | 22479 |



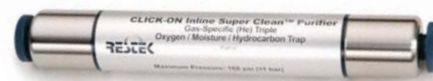
## Accessories

for Inline Super-Clean Gas Traps and Connectors

| Description   | qty.   | cat.# |
|---|--------|-------|
| 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.# |
|---|------|-------|
| <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)<br>inlet at 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 |       |          |       |
|---------------------------|---------------------------|-------|----------|-------|
|                           | 1/4-inch                  |       | 1/8-inch |       |
|                           | qty.                      | cat.# | qty.     | cat.# |
| 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.

welded end fittings for leak-free connection



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.# |
|---|------|-------|
| 1/8" Fittings (Similar to Supelco part# 2-2396) | ea.  | 21661 |
| 1/4" Fittings (Similar to Supelco part# 2-2398) | ea.  | 21660 |

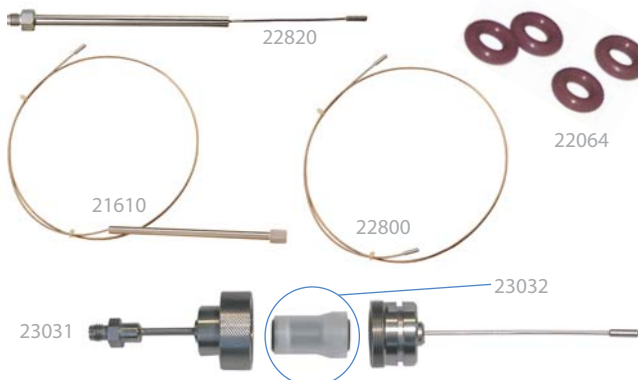
Replacement getter tubes must be used with a Thermal Gas Purifier housing unit.

### 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.# |
|--|------|-------|
| 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.# |
|---|---------------------------|--------|-------|
| 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<br>(43.48 x 34.19 x 45.6 cm) |
| Shipping Weight:         | 40 lbs. (18 kg) dry   |



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#### Parker Balston® Hydrogen Generators

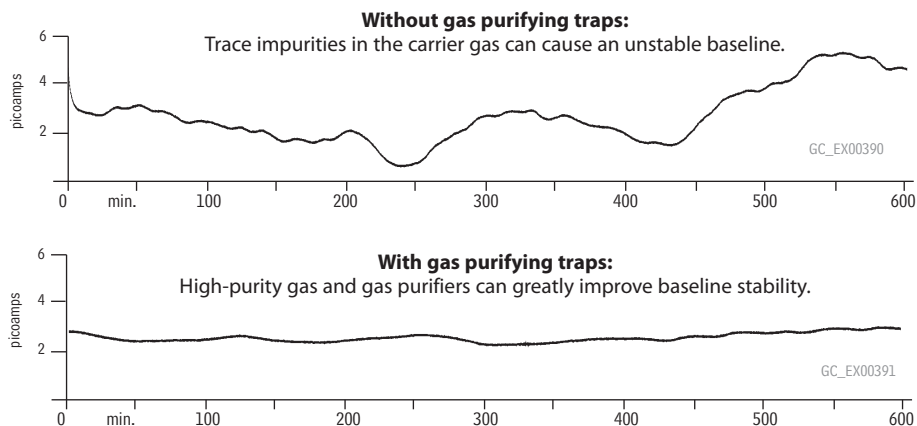
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lit. cat.# 580053A

| Description        | Model #   | Capacity   | qty. | cat.# |
|--------------------|-----------|------------|------|-------|
| 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 |

#### Replacement and Maintenance Components for Hydrogen Generators (for all models listed above)

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

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



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**FID Gas Stations**

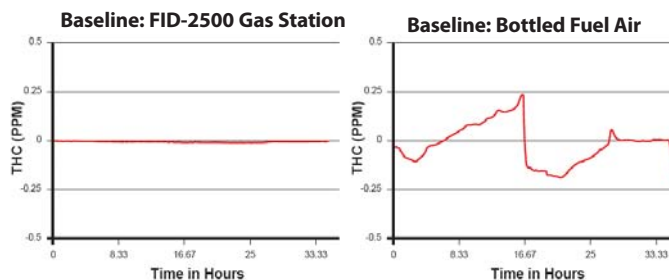
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lit. cat.# 580051

ordering note

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

Select the power cord you need.

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. # |
|-------------|-------------------------------------|------|--------|
| Gas Station | Model FID-1000 (ideal for 1-2 FIDs) | ea.  | 20177  |
| Gas Station | Model FID-2500 (ideal for 5-6 FIDs) | ea.  | 24913  |

**Replacement Components for FID Gas Stations**

|   |  |     |       |
|---|--|-----|-------|
| 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 |
|---|------|--------------|
| 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         |



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<br>(414/862kPa)              | 75 psig/120 psig<br>(517/827kPa)              |
| Electrical Requirements:        | 120 VAC/60 Hz                                 | 120 VAC/60 Hz                                 |
| Dimensions:                     | 35" h x 12" w x 16" d<br>(89cm x 30cm x 41cm) | 35" h x 12" w x 16" d<br>(89cm x 30cm x 41cm) |
| Shipping Weight:                | 115 lbs. (52 kg)                              | 115 lbs. (52 kg)                              |

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

| Inlet Air Pressure       | Maximum Outlet Flow (cc/min.)   |                         |
|--------------------------|---------------------------------|-------------------------|
|                          | Models HPN2-1100 and UHPN2-1100 | Maximum Outlet Pressure |
| 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)        |
| <b>Model HPN2-2000</b>   |                                 |                         |
| 75-120 psig (517-827kPa) | 2000                            | 90 psig (621kPa)        |



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**Nitrogen Generators**

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lit. cat.# 580052

**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

**ordering note**

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

| Nitrogen Generators | Model #                                   | qty. | cat.#     |
|---------------------|---|------|-----------|
| 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.#     |
| 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 |
|---|------|--------------|
| 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<br>or N2-14A                                | N2-22<br>or N2-22A                                  | N2-35<br>or N2-35A                                  |
|-----------------------------|---|---|---|---|---|
| Maximum Nitrogen Flow Rate: | 32 lpm  | 8 lpm   | 78scfh at 95% purity                              | N2-22: 44 lpm<br>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<br>N2-14A: 120VAC/60Hz                | N2-22: None<br>N2-22A: 120VAC/60Hz                  | N2-35: None<br>N2-35A: 120VAC/60Hz                  |
| Dimensions:                 | 27.6" h x 35.4" w x 12.2" d<br>(70cm x 90cm x 31cm) | 11" h x 13" w x 16" d<br>(27cm x 34cm x 41cm) | 50" h x 16" w x 16" d<br>(127cm x 41cm x 41cm)    | 50" h x 16" w x 16" d<br>(127cm x 41cm x 41cm)      | 50" h x 16" w x 16" d<br>(127cm x 41cm x 41cm)      |
| Shipping Weight:            | 205 lbs. (93 kg)                                    | 43 lbs. (20 kg)                               | N2-14: 75 lbs. (34 kg)<br>N2-14A: 80 lbs. (36 kg) | N2-22: 101 lbs. (46 kg)<br>N2-22A: 106 lbs. (48 kg) | N2-35: 115 lbs. (52 kg)<br>N2-35A: 119 lbs. (54 kg) |

| Nitrogen Generators for LC/MS      | Model #  | qty. | cat.#     |
|------------------------------------|--|------|-----------|
| 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.#     |
| 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.



**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.



| 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)                           |

| Zero Air Generator  | Model #  | Capacity        | qty.        | cat. #        |               |
|---|--|-----------------|-------------|---------------|---------------|
| 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         |               |
| Maintenance Kit   | for HPZA-3500, HPZA-7000, HPZA-18000, HPZA-30000 |                 | kit         | 21647         |               |
| <b>Replacement Catalyst Towers</b>  | <b>Model #</b>                                   | <b>Capacity</b> | <b>qty.</b> | <b>cat. #</b> |               |
| 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         |               |

**ordering note**

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



**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 |
|---|------|--------------|
| 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.#    |
|--|------|----------|
| <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.# |
|--|-------------------------|--------------------------------|------|-------|
| 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.# |
|--|-------------------------|--------------------------------|------|-------|
| 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.# |
|------------------------|----------------------|--------------------------------|------|-------|
| 1/4" female NPT ports* | 0-50psig (0-345kPa)  | 30" - 0 to 100psig (0-689kPa)  | ea.  | 21666 |
| 1/2" 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.# | qty.            | cat.# |
| Male Connector   | 1/4" to 1/2" NPT | 400-1-4             | 10-pk. | 23134 | 2-pk.           | 23184 |
| Male Connector   | 1/8" to 1/4" NPT | 200-1-4             | 10-pk. | 23136 | 2-pk.           | 23186 |
| Tube End Reducer | 1/4" to 1/8"     | 200-R-4             | 5-pk.  | 23129 | 2-pk.           | 23179 |



23134



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.# |
|--|-------------------------|--------------------------------|------|-------|
| 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.# |
|--|-------------------------|--------------------------------|------|-------|
| 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.# |
|-------------------------------|--------|-------------------------|------|-------|
| 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.# |
|--|------|-------|
| 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.# |
|---|------|-------|
| 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 |             |

### 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 pigtails 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.#    |
|--|------|----------|
| 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.#    |
|-----------------------------------|------|----------|
| 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.# |
|--|------|-------|
| 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.# |
|-----------------------------------|------|-------|
| 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.# |
|-----------------------|------|-------|
| 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.# |
|---------------------------|------|-------|
| 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.# |
|----------------------------|------|-------|
| 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.# |
|-------------------|---------------|------|-------|
| 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.# |
|-------------------------------|--------|------|-------|
| 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   | 1/8" brass nut (20)                     |
| B-402-1   | 1/4" brass nut (20)                     |
| B-203-1   | 1/8" brass front ferrule (20)           |
| B-403-1   | 1/4" brass front ferrule (20)           |
| B-204-1   | 1/8" brass back ferrule (20)            |
| B-404-1   | 1/4" brass back ferrule (20)            |
| B-200-C   | 1/8" brass cap (6)                      |
| B-400-C   | 1/4" brass cap (6)                      |
| B-200-P   | 1/8" brass plug (6)                     |
| B-400-P   | 1/4" brass plug (6)                     |
| B-200-6   | 1/8" 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   | 1/8" brass tee (2)                      |
| B-400-3   | 1/4" brass tee (2)                      |
| B-400-R-2 | 1/8" 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 | 1/8" inspection gauge (1)               |
| MS-IG-400 | 1/4" inspection gauge (1)               |

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

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

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

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

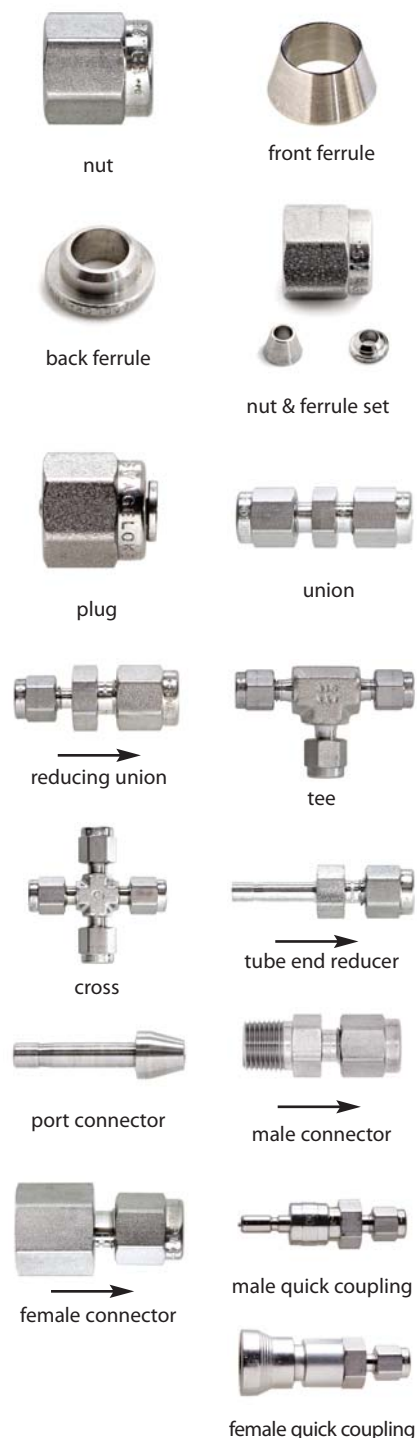
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**Swagelok® Fittings (Brass & Stainless Steel)**

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.



| Fitting Type                  | Size              | Swagelok # | qty.   | Brass |        | 316 Grade Stainless Steel |      |
|-------------------------------|-------------------|------------|--------|-------|--------|---------------------------|------|
|                               |                   |            |        | cat.# | qty.   | cat.#                     | qty. |
| 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.

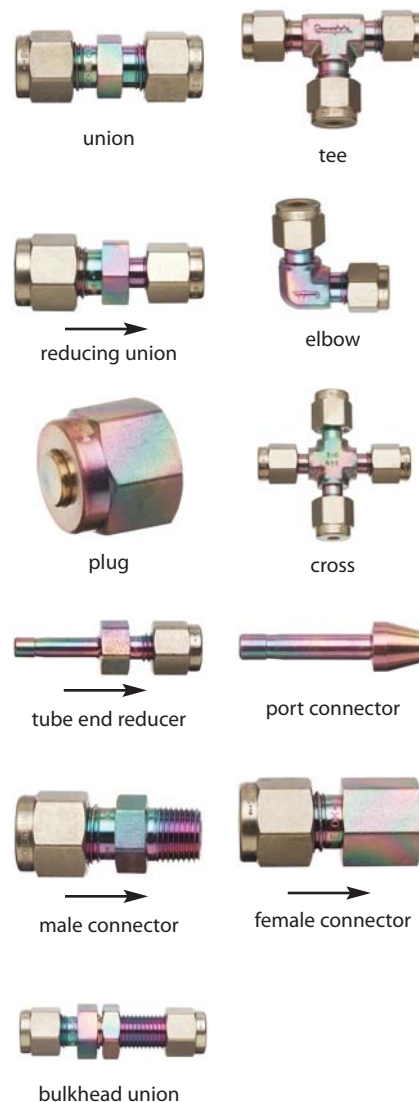
also available

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.# | qty.                  | cat.# |
| 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 | 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.



# Fittings

## Parker® Fittings (Brass & 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.



nut



front ferrule



back ferrule



nut & ferrule set



plug



union



reducing union



tee



cross



tube end reducer



port connector



male connector



female connector



male & female quick couplings

| Fitting Type                  | Size               | Parker # | Brass  |       | 316 Grade Stainless Steel |       |
|-------------------------------|--------------------|----------|--------|-------|---------------------------|-------|
|                               |                    |          | qty.   | cat.# | qty.                      | cat.# |
| 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.# | qty.                  | cat.# |
| 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             | 1/8"               | 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 | —                     | —     |

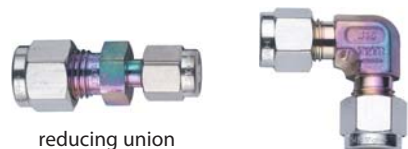
Please note: Nuts and ferrules are not treated unless requested (custom parts). Nuts and ferrules normally are not in contact with sample pathway, and thus do not require coating.

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



union

tee



reducing union

elbow



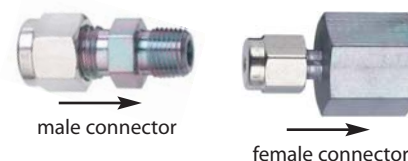
plug

cross



tube end reducer

port connector



male connector

female connector

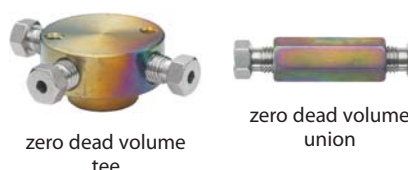


plug valve, 2-way

ball valve, 2-way

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

| Fitting Type           | Size  | Siltek/Sulfinert Treated |       |
|------------------------|-------|--------------------------|-------|
|                        |       | qty.                     | cat.# |
| 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 tee

zero dead volume union





## 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     |          |         | Length (per-foot pricing on 26 feet or more) |             |  |
|------------|----------|---------|--|-------------|--|
| Dimensions |          | 25 Feet | 26–100 Feet                                  | > 100 Feet* |  |
| ID (in.)   | OD (in.) | cat.#   | cat.#  | cat.#       |  |
| 0.01"      | 1/16"    | 21500   | 21501  | 21502       |  |
| 0.02"      | 1/16"    | 21503   | 21504  | 21505       |  |
| 0.03"      | 1/16"    | 21506   | 21507  | 21508       |  |
| 0.04"      | 1/16"    | 21509   | 21510  | 21511       |  |
| 0.085"     | 1/8"     | 21512   | 21513  | 21514       |  |
| 0.21"      | 1/4"     | 21515   | 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

### Precleaned Copper Tubing

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

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



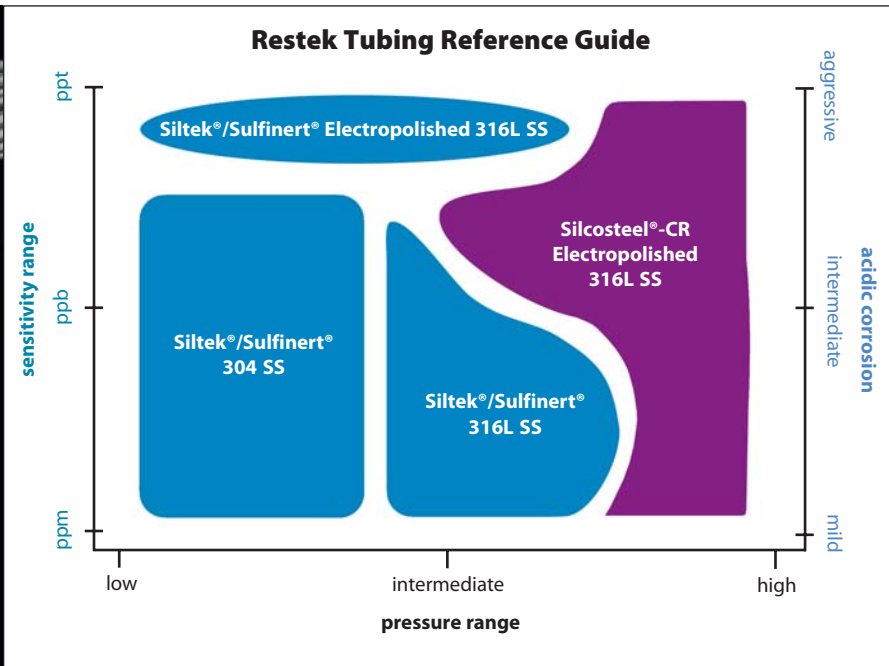
### Plumbing a GC

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.

frequently asked question

**Which treated tubing should I use?**

This chart will help you determine the tubing best suited to your application with respect to pressure, sensitivity of your analysis, and acidic environment exposure. For more frequently asked questions on treated tubing, see previous page.



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

## Minimum Bend Radius for Coated Tubing

| OD                               | Min. Bend Radius |
|----------------------------------|------------------|
| ≤ <sup>1</sup> / <sub>16</sub> " | 1" (2.5 cm)      |
| <sup>1</sup> / <sub>8</sub> "    | 2" (5.1 cm)      |
| <sup>1</sup> / <sub>4</sub> "    | 4" (10.2 cm)     |
| <sup>3</sup> / <sub>8</sub> "    | 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.# | 5-24 ft. | 25-99 ft. | 100-299 ft. | > 300 ft. |
|--|-----------------|----------------|-------|----------|-----------|-------------|-----------|
| <sup>1</sup> / <sub>8</sub> " (3.18mm) | 0.085" (2.16mm) | 0.020"         | 22538 |          |           |             |           |
| <sup>1</sup> / <sub>4</sub> " (6.35mm) | 0.180" (4.57mm) | 0.035"         | 22539 |          |           |             |           |

## Silcosteel®-CR Treated (Coiled)

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

<sup>1</sup>/<sub>8</sub>" OD: 5 ft. to 95 ft. in one continuous coil; <sup>1</sup>/<sub>4</sub>" 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.# | 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 |          |            |             |           |
| <sup>1</sup> / <sub>16</sub> " (1.59mm) | 0.010" (0.25mm) |                | 22502 |          |            |             |           |
| <sup>1</sup> / <sub>16</sub> " (1.59mm) | 0.020" (0.51mm) |                | 22503 |          |            |             |           |
| <sup>1</sup> / <sub>16</sub> " (1.59mm) | 0.030" (0.76mm) |                | 22504 |          |            |             |           |
| <sup>1</sup> / <sub>16</sub> " (1.59mm) | 0.040" (1.02mm) |                | 22505 |          |            |             |           |
| <sup>1</sup> / <sub>8</sub> " (3.18mm)  | 0.085" (2.16mm) | 0.020"         | 22506 |          |            |             |           |
| <sup>1</sup> / <sub>4</sub> " (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.# | 5-24 ft. | 25-199 ft. | 200-399 ft. | > 400 ft. |
|--|-----------------|----------------|-------|----------|------------|-------------|-----------|
| <sup>1</sup> / <sub>8</sub> " (3.18mm) | 0.055" (1.40mm) | 0.035"         | 22508 |          |            |             |           |
| <sup>1</sup> / <sub>4</sub> " (6.35mm) | 0.180" (4.57mm) | 0.035"         | 22509 |          |            |             |           |
| <sup>3</sup> / <sub>8</sub> " (9.52mm) | 0.277" (7.04mm) | 0.049"         | 22914 |          |            |             |           |

## Silcosteel®-CR Treated (Coiled)

| OD                                     | ID              | Wall Thickness | cat.# | 5-24 ft. | 25-199 ft. | 200-399 ft. | > 400 ft. |
|--|-----------------|----------------|-------|----------|------------|-------------|-----------|
| <sup>1</sup> / <sub>8</sub> " (3.18mm) | 0.055" (1.40mm) | 0.035"         | 22896 |          |            |             |           |
| <sup>1</sup> / <sub>4</sub> " (6.35mm) | 0.180" (4.57mm) | 0.035"         | 22897 |          |            |             |           |
| <sup>3</sup> / <sub>8</sub> " (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.# |
|------------------|-----------------|----------------|------|-------|
| $1/8$ " (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.# |
|------------------|-----------------|----------------|------|-------|
| $1/8$ " (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.# | 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.# | 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.# | 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

# Gas Valves, VCO Fittings

## Shut-Off Gas Valves Swagelok®



| Valve Type | 1/8" Brass |     | 1/4" Brass |     | 1/8" Stainless Steel |     | 1/4" Stainless Steel |     |
|------------|------------|-----|------------|-----|----------------------|-----|----------------------|-----|
|            | 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®



| Description                                   | qty. | cat.# |
|---|------|-------|
| 1/8" Brass Metering Valve, straight           | ea.  | 23148 |
| 1/4" Brass Metering Valve, straight           | ea.  | 23149 |
| 1/8" Stainless Steel Metering Valve, straight | ea.  | 23204 |
| 1/4" Stainless Steel Metering Valve, straight | ea.  | 23205 |
| Vernier Knob for Metering Valve               | ea.  | 23206 |



## Shut-Off Gas Valves Parker Balston®



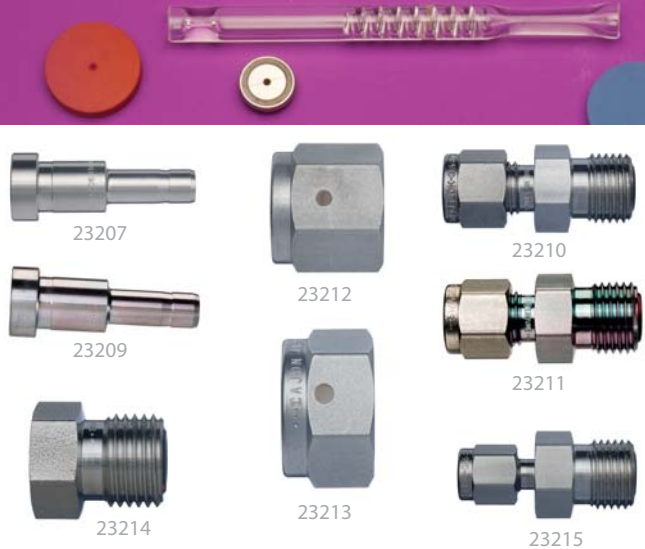
| Valve Type | 1/8" Brass |     | 1/4" Brass |     | 1/8" Stainless Steel |     | 1/4" Stainless Steel |     |
|------------|------------|-----|------------|-----|----------------------|-----|----------------------|-----|
|            | cat.#      | ea. | cat.#      | ea. | cat.#                | ea. | cat.#                | ea. |
| Toggle     | 22188      |     | 22189      |     | 22190                |     | 22191                |     |
| Ball       | 22192      |     | 22193      |     | 22194                |     | 22195                |     |
| Plug       | 22196      |     | 22197      |     | 22198                |     | 22199                |     |

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

## Metering Gas Valves Parker Balston®



| Description                                 | qty. | cat.# |
|---|------|-------|
| 1/8" Nickel-Plated Brass Metering, straight | ea.  | 22200 |
| 1/4" Nickel-Plated Brass Metering, straight | ea.  | 22201 |
| 1/8" Stainless Steel Metering, straight     | ea.  | 22204 |
| 1/4" Stainless Steel Metering, straight     | ea.  | 22205 |
| Vernier Knob for Metering Valve             | ea.  | 22209 |



## 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.# |
|---|-----------------|--------|-------|
| 1/2" VCO to 1/4" Tube Adaptor   | Stainless Steel | 2-pk.  | 23207 |
| 1/4" VCO to 1/4" Tube Adaptor   | Siltek Treated  | 2-pk.  | 23209 |
| 1/4" VCO to 1/4" Tube Fitting   | Stainless Steel | 2-pk.  | 23210 |
| 1/2" VCO to 1/4" Tube Fitting   | Siltek Treated  | ea.    | 23211 |
| 1/4" VCO to 1/8" Tube Fitting   | Stainless Steel | 2-pk.  | 23215 |
| 1/4" VCO to 1/8" Tube Fitting   | Siltek Treated  | ea.    | 23216 |
| 1/2" VCO Nut  | Stainless Steel | 2-pk.  | 23212 |
| 1/4" VCO Nut Blind  | Stainless Steel | 2-pk.  | 23213 |
| 1/4" VCO Body Blind   | Stainless Steel | 2-pk.  | 23214 |
| Replacement O-Ring, 70 Durometer Fluorocarbon FKM, VCO 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.# |
|---------------------|------|-------|
| 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.# |
|-------------|------|-------|
| Tool Kit    | kit  | 23004 |

**Plier Set**

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



| Description | qty. | cat.# |
|-------------|------|-------|
| 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.# |
|---------------------------------------|------|-------|
| 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.# |
|---------------------------------|------|-------|
| 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.# |
|----------------------|------|-------|
| Torx Screwdriver Set | set  | 23034 |



Magnetic!

23002

**5-in-1 Magnetic Screwdriver**

Magnetic power tip holds bits and screws securely.

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



23001

**Wrench Set**

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

| Description | qty. | cat.# |
|-------------|------|-------|
| Wrench Set  | set  | 23001 |

# Tubing Tools



### 1/16-Inch Tubing Cutter

20192

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

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



Dimensions: 8" x 6 1/4" 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.# |
|--------------------------------|-------|-------|
| 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).

### 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.# |
|--|-------|-------|
| 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.



### 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.# |
|---------------------------------|------|-------|
| Ridgid Heavy-Duty Tubing Cutter | ea.  | 22621 |



### 1/16-Inch Tubing Cutting Pliers

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

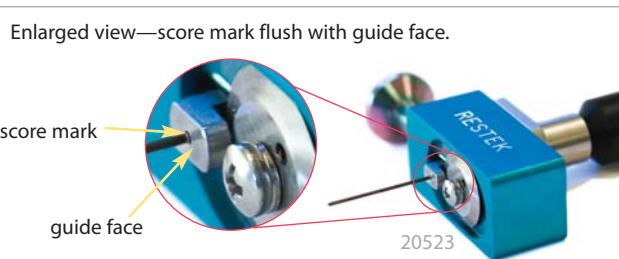
| Description                 | qty. | cat.# |
|-----------------------------|------|-------|
| 1/16" Tubing Cutting Pliers | ea.  | 20193 |

### 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.



| Description  | qty. | cat.# |
|--|------|-------|
| 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.# |
|----------------------|--------------------------------|------|-------|
| 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.# |
|---------------------------|------|-------|
| 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.# |
|---------------|------|-------|
| 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.# |
|--------------|------|-------|
| 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.# |
|---------------|------|-------|
| 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.# |
|-------------|------|-------|
| 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.# |
|-------------|-------------|-----------------------------|------|-------|
| 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.# |
|----------------------|------|-------|
| Gap Inspection Gauge | ea.  | 22624 |