

Analytical Success That Repeats Itself

Repeatability and consistency. They are the keys to accurate sampling and analytical measurement. To help ensure your accuracy Praxair® offers a complete line of gas handling and distribution equipment, sample cylinders and valves featuring the Silcosteel™ metal passivation treatment process. This provides a fully integrated inert analysis pathway to help you maximize your analytical repeatability and consistency.

How Silcosteel Works

Treating parts and components with Silcosteel is a proven way to create inert, corrosion-resistant surfaces. Developed by Restek Corporation, a leading provider of analytical chromatographic components, the Silcosteel process covers metal surfaces with inert silica from several angstroms to 5 microns thick. The Silcosteel metal passivation process utilizes temperatures to 750 °F (400 °C), bonding the silica layer permanently to the metal.

Bonding keeps the part flexible so it won't flake or crack during typical use and handling in a laboratory or process line. A secondary deactivants layer can be added to further improve adsorption against specific chemicals and sample wetting characteristics, and increase resistance against chemical or steam attack.

Have you observed the following?

- Different reading from different cylinders
- Non-reproducible response when gas system is open to the atmosphere
- Signal drift over many measurements
- Large relative standard deviation in measurements
- Cannot reproduce the work of other people



Silcosteel-Treated Gas Delivery System

The Silcosteel treatment of pressure regulators and other gas delivery systems significantly improved the measurement of sulfur compounds. The impact was still significant at concentrations as high as 25 ppm.

The treatment of either single stage or dual stage regulators did not affect the mechanical functionality of these systems. The positive impact of treatment is seen in the results shown below.

| Praxair Test | 316 SS vs. | Silcosteel™ |
|-----------------|------------|-------------|
| Precision | - 17% | - 1% |
| Reproducibility | - 20-40% | - 1% |
| Signal Strength | X | 1.4 X |

Silcosteel-Treated Gas Delivery System Product Line

Whether it's tubing and fittings, or an entire inert system, Praxair has the solution for your analytical sampling and measurement projects.

- Regulators
- Diaphragm Valves
- Tubing And Fittings
- Sample Cylinders and Valves
- SilcoCan™ Canisters

Ordering Information

Dual and Single Stage Silcosteel™-Treated Regulators

| | A | B | C | D | CGA | |
|--|---|---|---|--|--|---|
| Dual Stage – 432 Series Part Number Configurator – CON432ABCDGARGAR | Outlet Pressure 2: 0 to 50 psig 3: 0 to 100 psig | Outlet Gauge 30"-0-100 psig 30"-0-200 psig | Inlet Gauge 3: 0 to 4000 psig | Outlet Assembly 0: 1/4" FPT Port 3: Diaphragm Valve 1/4" Tube Fitting 8: Diaphragm Valve 1/8" Tube Fitting | Assembly / Gauges 1: Standard Assembly (psi/kPa Gauges) | Inlet Connection 350, 330 and 660 |
| Single Stage – 422 Series Part Number Configurator – CON422ABCDGARGAR | Outlet Pressure 2: 0 to 50 psig 3: 0 to 100 psig | Outlet Gauge 30"-0-100 psig 30"-0-200 psig | Inlet Gauge 3: 0 to 4000 psig | Outlet Assembly 0: 1/4" FPT Port 3: Diaphragm Valve 1/4" Tube Fitting 8: Diaphragm Valve 1/8" Tube Fitting | Assembly / Gauges 1: Standard Assembly (psi/kPa Gauges) | Inlet Connection 350, 330 and 660 |

Example: Part Number CON4323331330R - Dual Stage Stainless Steel Regulator / 0 to 100 psig Delivery Pressure / 0 to 4000 psig Inlet Gauge / Diaphragm Valve with 1/4" FPT Outlet / Standard Assembly / 330 CGA Inlet / Silcosteel-Treated.

Note: Other options are available. Please contact Praxair regarding configuration options needed for your application.

Optional Order – Regulator with Protocol Station

Part Number – Add Letter "M" after Regulator Part Number.

Description – Regulator with Protocol Station (convenient wall mounting of system). Includes Tee, bracket, 1/4" rigid tubing and CGA inlet with inlet gland check valve. All wetted surfaces are Silcosteel-treated.

Silcosteel-Treated Welded/Drawn Grade 304 Stainless Steel Tubing

| Part Number | ID, OD |
|-------------|--|
| REK20590 | 0.011" ID (0.28 mm ID), 0.022" OD (0.56 mm OD) |
| REK20591 | 0.021" ID (0.53 mm ID), 0.029" OD (0.74 mm OD) |
| REK20592 | 0.010" ID (0.25 mm ID), 1/16" OD (1.59 mm OD) |
| REK20593 | 0.020" ID (0.51 mm ID), 1/16" OD (1.59 mm OD) |
| REK20594 | 0.030" ID (0.76 mm ID), 1/16" OD (1.59 mm OD) |
| REK20595 | 0.040" ID (1.02 mm ID), 1/16" OD (1.59 mm OD) |
| REK20596 | 0.085" ID (2.16 mm ID), 1/8" OD (3.18 mm OD) |
| REK20597 | 0.210" ID (5.33 mm ID), 1/4" OD (6.35 mm OD) |

Silcosteel-Treated Seamless Grade 316 Stainless Steel Tubing

| Part Number | ID, OD |
|-------------|--|
| REK20598 | 0.055" ID (1.40 mm ID), 1/8" OD (3.18 mm OD) |
| REK20599 | 0.180" ID (4.57 mm ID), 1/4" OD (6.35 mm OD) |

Silcosteel-Treated Straight Tubing 18" Length

| Part Number | ID, OD |
|-------------------|--|
| REK20575 | 0.085" ID (2.16 mm ID), 1/8" OD (3.18 mm OD) |
| REK20576 (5 Pack) | 0.085" ID (2.16 mm ID), 1/8" OD (3.18 mm OD) |
| REK20577 | 0.210" ID (5.33 mm ID), 1/4" OD (6.35 mm OD) |
| REK20578 (5 Pack) | 0.210" ID (5.33 mm ID), 1/4" OD (6.35 mm OD) |

Silcosteel-Treated Sample Cylinders

| Part Number | Description |
|-------------|--|
| REK24271 | Silcosteel-Treated Sample Cylinder - 75 cc |
| REK24272 | Silcosteel-Treated Sample Cylinder - 150 cc |
| REK24273 | Silcosteel-Treated Sample Cylinder - 300 cc |
| REK24274 | Silcosteel-Treated Sample Cylinder - 500 cc |
| REK24275 | Silcosteel-Treated Sample Cylinder - 1000 cc |

Silcosteel-Treated Cylinder Valves (used with sample cylinders)

| Part Number | Description |
|-------------|------------------------------------|
| REK24276 | Metal Stem Tip X 1/4" MPT Exit |
| REK24277 | Metal Stem Tip X 1/4" Tube Fitting |
| REK24278 | Kel-F Stem Tip X 1/4" MPT Exit |
| REK24279 | Kel-F Stem Tip X 1/4" Tube Fitting |

Silcosteel-Treated Fittings

| Part Number | Description |
|-------------|---|
| REK20510 | Union with Two 1/16" Compression Tube Fittings |
| REK20511 | Union with Two 1/8" Compression Tube Fittings |
| REK20512 | Union with Two 1/4" Compression Tube Fittings |
| REK20513 | Tee with Three 1/16" Compression Tube Fittings |
| REK20514 | Tee with Three 1/8" Compression Tube Fittings |
| REK20515 | Tee with Three 1/4" Compression Tube Fittings |
| REK20516 | Standard 90 Degree Elbow with Two 1/16" Compression Tube Fittings |
| REK20517 | Standard 90 Degree Elbow with Two 1/8" Compression Tube Fittings |
| REK20518 | Standard 90 Degree Elbow with Two 1/4" Compression Tube Fittings |
| REK20519 | Standard Reducing Fitting with 1/16" Tube Fitting x 1/8" Tube Fitting |
| REK20520 | Standard Reducing Fitting with 1/16" Tube Fitting x 1/4" Tube Fitting |
| REK20521 | Standard Reducing Fitting with 1/8" Tube Fitting x 1/4" Tube Fitting |
| REK20522 | Stainless Steel Union with 1/4" MPT x 1/4" Compression Tube Fitting |
| REK20523 | Stainless Steel Union with 1/4" MPT x 1/8" Compression Tube Fitting |
| REK20524 | Stainless Steel Union with Two 1/4" MPT Fittings |
| REK20580 | Zero Dead Volume Union with Two 1/16" Compression Tube Fittings |
| REK20582 | Zero Dead Volume Union with Two 1/8" Compression Tube Fittings |
| REK20581 | Zero Dead Volume Tee with Three 1/16" Compression Tube Fittings |
| REK20583 | Zero Dead Volume Tee with Three 1/8" Compression Tube Fittings |



Praxair Specialty Gases & Equipment
39 Old Ridgebury Road
Danbury, CT 06810-5113

Telephone:
1-877-PRAXAIR (1-877-772-9247)
Internet: www.praxair.com/specialtygases
E-mail: specialtygases@praxair.com

Praxair and the Flowing Airstream design are trademarks or registered trademarks of Praxair Technology, Inc. in the United States and/or other countries.

Other trademarks used herein are trademarks or registered trademarks of their respective owners.

The information contained herein is offered for use by technically qualified personnel at their discretion and risk without warranty of any kind.

© Copyright 2000 Praxair Technology, Inc. All rights reserved.

P-8479 2M 06/00