Swagelok
Swagelok Pittsburgh | Tri-State Area

FLOW
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*Put Our Team Alongside Yours*

# All Systems GO

*(and How to Keep Them That Way)*

## *The three primary analytical goals associated with optimal industrial fluid and sampling systems:*

- *A sample that's compatible with your analyzer*
- *A sample that's timely so actions can be taken based on the result*
- *A sample that's truly representative of the process conditions*

## *There are also three main operational objectives:*

- *A safe system*
- *A reliable system*
- *A cost-effective system*

## *However, to achieve these six goals, there are a number of seemingly "little things" to consider:*

**FIRST, materials matter for accurate measurement.** Even if you've installed premier process analyzers to ensure that your product is meeting required specifications, each analyzer is only as good as the analyzed sample. That is, several factors could easily and negatively impact the sample on its journey from process line to the analyzer, resulting in excessive downtime labor and costs.

Swagelok studies have shown that simple hose material incompatibility/poor suitability for any given application leads to permeation. For example, using a Teflon hose for gases with small molecules – such as hydrogen or helium – is not an ideal product choice as a technician is likely to get measurement errors, highly influencing sample representativeness. In addition, applying an improper hose could lead to adsorption as system media sticks to the tube or hose wall, also leading to measurement issues... and a faulty sample.

***Expert tip: Be certain all your fluid system componentry is fully compatible with your system media.***

**SECONDLY, avoid system complexity.** This, too, comes down to proper product choices for applications throughout your fluid lines. Pressure loss and heat transfer, of course, occur naturally as a fluid moves through your system... but there are measures you can take to maintain pressures at an adequate level. For instance, proper line sizing and valve selection will help maintain desired pressures – without overcomplicating your system. Swagelok Field Engineers have witnessed the use of sample pumps to maintain target pressures. But this type of solution means tying up your technicians as they must perform regular checkups, make replacements when parts fail, and more.

***Expert tip: Simply taking the time up front to identify and apply the correct valve would have made a pump totally unwarranted.***

**LASTLY, maintain correct pressures and temperatures.** Start by taking a sample from the gas process line. That way, you can quickly and accurately determine if the "right" temperature and pressure are being managed. If not, you will collect a bad sample. It doesn't take much to cause a significant gas temperature drop...just a foot of uninsulated or improperly heated tubing will help yield a poor or unusable sample.

Swagelok technicians have seen coalescers employed to remove liquids...at great risk to the sample integrity.

***Expert tip: Heated/insulated tubing would have prevented condensation in the first place.***

***No matter your industry or severity of application, we can help you optimize your fluid/sampling systems. Call or text Tim Davis, our Applications Engineer: 412.439.1705***

# One Problem. Multiple Solutions.

***Primary reasons overpressurization occurs in a fluid system:***

**1** **Human Error:** A technician may have opened the wrong valve, causing pressure to rise downstream. System conditions may have been incorrectly calculated. The wrong type of regulator may have been installed.

**2** **Component Wear:** If an appropriate component material alloy wasn't selected, corrosion could easily compromise pressure control.

**3** **Contamination:** Dirty fluids could negatively impact a regulator's performance. Particulates could compromise the seal, enabling unwanted pressure to creep past the seat and leading to a rise in downstream pressure.

**4** **Power Loss:** If some components in your system rely on electronic control, a sudden stoppage could drastically affect functionality.

## How We Can Help:

SWAGELOK
### Regulators

Regulators, of course, are usually your first option for maintaining precise pressures throughout a fluid system. But, when high pressures, potential/accidental pressure changes, and/or dangerous media are involved, a fail-safe backup measure is essential to ensure the necessary escape of excess pressure.

### ALSO,

**Swagelok Pressure Relief Valves offer superior protection against overpressure – to keep your workers and critical equipment safe in even the most challenging Oil and Gas, Chemical, and Power Generation applications.**

## Also Consider:

SWAGELOK
### Check Valves

- Reliably stop backflow by forcing fluid to flow in one direction
- High-quality construction
- Precise pressure control
- Available with adjustable or fixed cracking pressure
- Exceptional in high-pressure environments

SWAGELOK
### Bleed Valves

- Used to assist in calibration of control tools
- Ideal for instrumentation devices such as multi-valve manifolds
- Compact and easy to install
- Vent signal line pressure to atmosphere before instrument removal
- NPT and SAE end connections available

YOUR LOCAL SWAGELOK
### Design & Build Center
*specializes in*
### Custom Setting of Relief Valves

We employ a state-of-the-art Setting Station, featuring precision-calibrated gauges, to accurately set your Relief Valves at a pressure up to 1500 psi for gas service. In addition, to ensure ultimate product safety and quality, we complete a highly detailed sign-off sheet for every valve set – with a certified Swagelok inspector verifying the pressure.

# ALMOST HERE...

*Visit booth 700 at the Eastern Gas Compression Roundtable,*
***MAY 6-8,***
*at the David L. Lawrence Convention Center in downtown Pittsburgh*

egcr

You'll see first-hand the latest Swagelok product and services innovations that will help you increase productivity in the Midstream/Oil and Gas market. In addition, sign up today for our detailed Tube Bending Safety and Best Practices seminar where we'll show you how to expertly measure, cut, and bend tubing of various lengths, diameters, and materials!

***To register, visit: https://www.egcr.org***

# PUT OUR TEAM ALONGSIDE YOURS

Swagelok is more – exceptionally and uniquely more, in fact – than other componentry makers and suppliers; we are aggressively committed and dedicated to becoming your valued and trusted ***Fluid-System Partner*** – enabling you to tap into our expert and vast system design, operational, and optimization know-how to advance your overall performance and profitability...no matter how challenging your applications and working conditions.

## *Here are just a few examples of how we can help you quickly and cost-effectively do more with less:*

### For Industrial Plant Operations, we can:

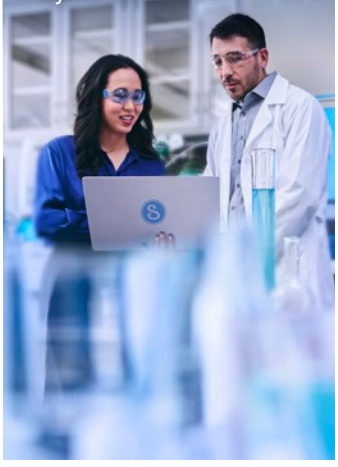
- Identify dangerous and costly leakage via our fluid-system and industrial hose evaluations
- Solve known system issues or provide new, improved systems
- Provide the technical know-how to reduce costs and downtime

### For Clean Energy Commercialization, we can:

- Recommend products with the needed tolerance to provide long-term results
- Increase your overall system uptime via our Safety Training and technical counsel
- Deliver safe, reliable, tested, locally built assemblies for utmost performance

### For Research & Development, we can:

- Share recommendations that will maximize gas system output
- Deliver safe, reliable, tested, locally built assemblies for utmost performance
- Suggest the right components to ensure compliant, compatible systems



### For Process Fluid Sampling, we can:

- Improve sampling accuracy and precision
- Deliver locally designed, built, and fully tested sample panels
- Upgrade your sampling safety and efficiency via advanced training

### For Construction and Project Planning, we can:

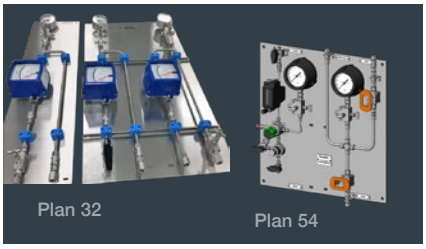
- Prevent expensive errors and delays via extensive training and technical counsel
- Deliver standardized, pre-built subsystems for optimal operational efficiency
- Keep you on schedule with dependable component sourcing advice

***Just one call to 412.761.3212*** will get you the immediate and proven support you need to save time, money, and risk...we are your local fluid-system ***solutions provider*** for leak-tight, top-quality products, assemblies, and sub-assemblies. Plus, we offer a wide array of Strategic Services – safety training, custom fabrication, pristine tool rentals, energy-loss/hose surveys – to supplement our Swagelok componentry lines.

# Seal(s) of Approval

Swagelok Mechanical Seal Support Systems are better by design. They're also easy to configure and install, and locally built by Swagelok master technicians – with all work covered by the Swagelok Limited Lifetime Warranty

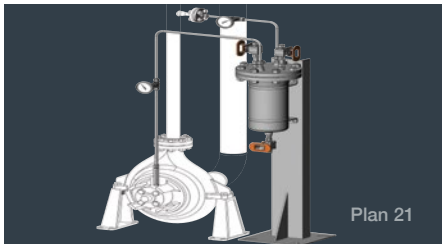
***Here are three recent major challenges where Swagelok made a genuine positive difference to Chemical customer Bottom Lines:***




A major Chemical plant had panels on their rotating equipment throughout the site to distribute fluid to mechanical seals on pumps and compressors. But the panel designs were not uniform, leading to significant pressure, leakage, and process contamination issues.

Swagelok was brought in to assist with panel standardization. Immediately, we applied 3D CAD models and concept drawings to devise Plan 32 and Plan 54 seal support panels.

***The plant's Reciprocating Engineer was highly complimentary of Swagelok's ability to identify and remedy his pain points – and our overall product and application expertise.***




Another large Chemical plant required an improved customized Plan 21 layout for mechanical seals versus one previously provided by another supplier. The existing product was not a standard seal plan design...thus causing extremely high operational costs and lengthy lead times.

Swagelok fabricated assemblies, specifically tailored for the site's needs, were quickly approved as the go-to for faster workflow, lower costs, and consistent quality.

***The plant's Reliability Engineer was completely satisfied with Swagelok's ability to save substantial – and valuable – functional time and capital.***

A third Chemical plant needed to eliminate extreme costs from multiple failures due to no or low flow to mechanical seals. Operator error was also a suspected cause of the problem.

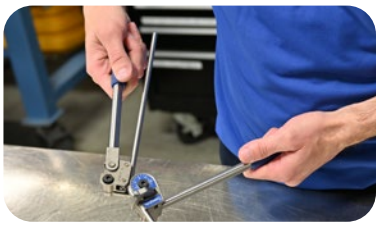
Swagelok's nearby team came on site to fully assess the site's current seal-related operations and desired improvements. Our vast technical and application know-how rapidly led to implementation of Swagelok custom L-porting tandem bypass valves to ensure no further potential for technician mistakes. Swagelok bleed valves were also employed to enable operators to simulate a seal leak to securely test high-flow alarms.

***The plant's Mechanical Design Engineer stated that Swagelok greatly helped improve site safety and simplified overall operational methodology and consistency.***

# FINEST IN THE FIELD

## Customer Challenge

A major maker of fleet conversion systems desperately needed to lower production/process costs to stay competitive as demand for its units increased. Our customer's workforce was spending far too much time bending tube and employing other manual procedures that were not only negating profit levels, but introducing a likelier potential for human error as well.



## Our Solution

Swagelok Design & Build experts were tasked with delivering stainless steel pre-bent tubing solutions to help control the account's labor costs. Initial tests were so successful a new process was immediately adopted across all production areas. No more tedious, time-consuming hand bending by customer techs...and no more high fixed labor charges!

In addition, overtime and the need for more workers during peak demand became unnecessary. In fact, the total production time for one of our customer's more challenging offerings was slashed from 16 hours to four.

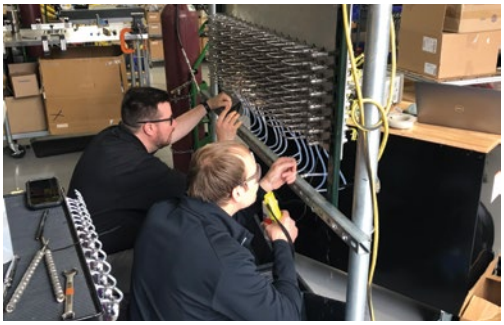
## Bottom Line

In all, the Swagelok safe, easily adapted fabrication know-how and handiwork saved more than $220,000 in labor in just one year – and created an even stronger, more trusted, ongoing customer-supplier bond.

# BETTER BY DESIGN

*(and How They're Built)*

Your local and always-ready Swagelok Pittsburgh | Tri-State Area Custom Fabrication Service delivers leak-tight, ultra-safe, easy-to-install panels, skids, and sub-assemblies that have been masterfully constructed and fully inspected/tested...and always come as one convenient part number!



## Our Promise:

We will save you significant time, money, and worry when your production schedules are tight

We will deliver assemblies that will help you get more done and more out the door faster

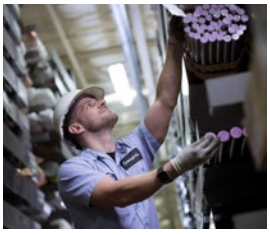
We will collaborate fully with you at every step of our work process: ***design through delivery***

## ABOVE ALL, *QUALITY*

For almost 80 years, the Swagelok brand has been synonymous with safety, reliability, and unparalleled performance, particularly in the most challenging fluid-handling applications.

### *But one word best defines our core commitment and promise to you:* QUALITY.

From the raw materials and stringent design/manufacturing processes we employ to manufacture our products...to the renowned Swagelok Quality System we apply locally to our quoting, order entry, shipping/receiving, internal training, and fabrication operations, we continually seek to achieve an organizational excellence that ensures we always deliver the ultimate customer experience.



# FIVE REASONS...

## *...NOT to assemble the nuts, ferrules, and/or bodies of two or more Tube Fitting brands to make a "new" component:*

- **Worker safety can be easily compromised when substituting parts from one maker's fitting with another's – making all such "new" components completely UNTESTED**
- **No fitting brand (OR its parts) is explicitly made to work together with another brand**
- **Sealing surface inconsistencies and incompatibilities will likely result from significant differences in design, construction, torque value, geometry, tolerances, metallurgical properties, and more**
- **Seals will also be ineffective due to varied swaging mechanisms and material hardness**
- **Fatigue failure could occur as well**

So, trying to save a little on operational costs could mean wildly unpredictable performance, major safety hazards, a vastly weakened overall Bottom Line, and even voided product warranties if/when leakage or other connection issues happen.

***In fact, the IOGP JIP-33, an initiative aimed at making substantial improvements in the specification, procurement, and delivery of global Oil and Gas equipment, bluntly labels tube fitting intermix as a "bad Engineering practice."***

## OUR EXPERT **Recommendation:**

**Single-source your tube fittings, thus avoiding any potential to even accidentally combine brands or one brand's parts with another's... eliminating risks to your technicians and property, while ensuring an optimal fluid system.**

# ATTENTION, ALL TECHNICIANS:

*PRESENTING THE GLOBALLY RENOWNED*

## Swagelok Tube Fitting Installation & Tube Bending Safety Essentials 1-Day Course

**In just one day,** at your facility or at our leading-edge Pittsburgh Training Center, **in a highly hands-on learning environment,** you will graduate with the necessary skills to virtually eliminate line leakage, no matter what your market or severity of applications.

We provide all training materials: manuals, formulas, gap gauges, tube benders, tube fittings, tube cutters... All you need to do is to show up when/where your session will be held. You will spend your valuable time pulling up fittings, cutting tubing of various compositions and diameters, as you build an actual fluid system with a minimum number of connections.

## Analyzer Technician Training 2-Day Course

***Particularly relevant for those new to sampling... as well as analyzer and laboratory technicians***

- Hands-on learning that will hone your ability to find and address root causes of challenges
- Evaluate an existing sample and apply gained knowledge to reverse-engineer a system
- Get the engineering principles, formulas, and calculations to eliminate system guesswork
- Among multiple other learnings, fully understand the severe and unsafe consequences of inaccurate sampling

*To get more details or to register for either class, call or text 412.439.1706.*

# TAG TALES

**Why guess at what the key components within your fluid system are controlling or carrying? By simply adding tags, you can make your workers and site far safer and more productive.**

### For example:

- Simple Hose and Valve tags help eliminate identification headaches for maintenance
- A Hose tag tells a tech when Hose was installed, its core material, what fluid it's carrying
- Tags help techs be proactive to replace critical components before they fail
- Tags help techs document specific system locations where problems have occurred

### *At a minimum...*

**...tags should specify part number, date of manufacture, trace identification number, system media, operating pressure, and operating temperature.**

- Tags help support a healthy overall preventative management program
- Hose tags can be encapsulated in silicone to minimize entrapment, ease exterior cleaning
- Multiple tag types and sizes available, from metal to color-coded/ wrap-around styles

## CHOOSE FROM 4 TAGGING OPTIONS:

**Lanyard**

*Attaches with a stainless steel lanyard and aluminum clamp.*

**Clamp**

*Attaches with two metal bands.*

**Mat**

*Attaches via an adhesive.*

**Perma**

*Attaches via an adhesive.*

# WHY SWAGELOK?

## It's as simple as...

## 1 PREMIUM LEAK-TIGHT *PRODUCTS*

### *Fittings*

For unparalleled leak-tight connections between fluid-system componentry

### *Valves*

Reliably control flow across a broad range of working pressures, temperatures, and operating conditions

### *Regulators*

Consistently and accurately maintain pressure levels over extended operating lifespans

### *Hoses*

Available in a vast array of materials, pressure ratings, and flexibility degrees

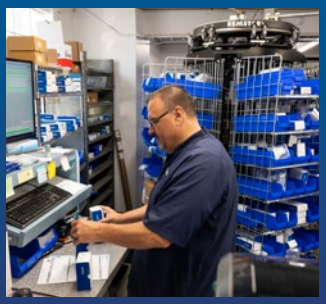
### *Assemblies*

Designed, built, and tested by Swagelok-certified engineers and technicians

## 2 EXTENSIVE LOCAL *INVENTORY*

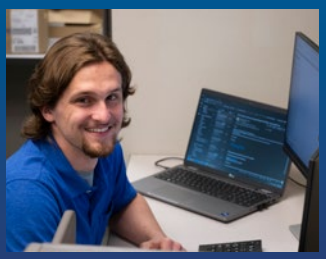
***We have just what you need – right when and where you need it.***

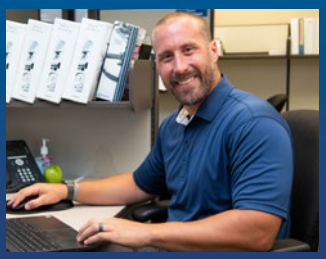
Always quickly and accurately shipped from our state-of-the-art carousel picking system.



## 3 PROVEN APPLICATION *EXPERTISE*

Our highly skilled and knowledgeable external and internal sales associates are always ready and willing to help you choose the best Swagelok tool for a particular application, no matter what the industry.





## + ESSENTIAL *STRATEGIC SUPPORT SERVICES*





**SWAGELOK PITTSBURGH | TRI-STATE AREA**

*YOUR LOCAL FLUID-SYSTEM EXPERTS*

*PITTSBURGH.SWAGELOK.COM | 412.761.3212 |*