

# Swagelok London

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Swagelok® Onsite Services

Local Solutions. Global Support.



# Swagelok Components – 70 Years of excellence in Manufacturing

Swagelok

Swagelok Company's  
expanding portfolio  
of products,  
assemblies, and  
services helps you  
solve your fluid  
system problems.

Swagelok  
Value beyond the expected®



## Tube Fittings

- Available in tube sizes 1/16 to 2 in. and 2 to 50 mm
  - Consistent gaugeability upon initial installation
  - Easy to disconnect and reattach
  - Wide variety of materials and configurations
- Patented Design:** Excellent gas-tight sealing and tube-gripping action, easily achieved proper installation, consistent removal, excellent vibration fatigue resistance and tube support, full compatibility with original Swagelok stainless steel tube fittings of identical sizes.



## Instrumentation Valves

- Variety of end connections including integral Swagelok tube fitting
  - Broad operating temperature range
  - Large selection of sizes and materials
  - Minimal dead volume and entrainment zones
- Types:** Ball, Needle, Check, Relief, Plug, Metering, Toggle, Manifold, Bleed and Purge



## General Industrial Fittings

- Available in sizes 1/16 to 2 in. and 2 to 50 mm
  - Wide variety of materials and configurations
  - Pressures from vacuum to 60 000 psi (4134 bar)
  - NPT, ISO15SP, and SAE threads
- Types:** Pipe, Weld, Vacuum, Flange, Medium-Pressure



## Process Valves and Manifolds

- Integral tube fitting ball valves in sizes up to 2 in. and 50 mm
  - Flanged process valves up to 3 in. (DN80)
  - A large variety of special application valves
- Types:** Ball, Needle, Single Block, Single Block and Bleed, Double Block and Bleed, Manifold



## High-Purity Fittings

- Available in sizes 1/16 to 1 in. and 6 to 18 mm
  - High-purity stainless steels and other materials
  - Wide variety of configurations
- Types:** VCR® Face Seal, VCR® Face Seal, Micro-Fit®, Weld



## Packless Valves

- High cycle, high-integrity sealing
  - Low- and high-pressure models available
  - All metal containment
  - Shutoff, bulk-gas distribution, and isolation service
  - High-purity stainless steels and other materials
- Types:** Bellows Sealed, Diaphragm Sealed



## Plastic Products

- Innovative CR-268® concentration monitor provides process monitoring for inline liquid chemical applications
  - Wide variety of PFA tube fittings and valves
  - UHP fluoropolymer diaphragm valves
  - High-purity PFA line threaded flare fittings
- Types:** PFA and Vinyl Tubing, PFA Plug Valves, PFA Needle Valves, Modified PTFE Diaphragm Valves and Concentration Monitor, PFA Check Valves and Fittings



## Welding System

- Cost effective and reliable gas tungsten arc welds
  - Lightweight, portable power supply
  - Meets ASME-BPE 2002 welding standards
- Types and Accessories:** Traditional and High-Purity Power Supplies, Weld Heads, Fitting Blocks, Side Plates, Plenum, and Collets



## Regulators

- Instrumentation-grade and ultrahigh-purity models
  - Unique design features such as metal-to-metal seal to atmosphere
  - Self-vent and captured-vent options
- Types:** Diaphragm Sensing, Piston Sensing, Pressure-Reducing, Back-Pressure, Vaporizing, Ultrahigh-Purity, Modular



## Gauges and Transducers

- Swagelok tube adapter and Swagelok VCR end connections available for easy positioning
  - A variety of mounting options
  - Meet ASME, EN, and JIS standards
- Gauge Types:** Industrial, Process, Safety, Miniature, Low-Pressure, High-Purity  
**Transducer Types:** Industrial, Explosion-Proof, Ultrahigh-Purity



## Sanitary Products

- Exceptional range of 3A compliant products
  - Common configurations and special lubrications
  - Large selection of valves, fittings, pumps, and accessories
  - Designed for easy cleaning and draining
- Types:** BPE Fittings, TS Fittings, CRF Radial Diaphragm Valves, West-Style Diaphragm Valves, Pumps, Block Body Valves, Skid-Mounted Systems, Tubing



## Hoses

- Custom lengths and other end connection combinations available
  - Wide variety of types and materials
  - Broad operating pressure and temperature range
  - Available in hose sizes 1/8 to 2 in. and 3 to 50 mm
- Types:** All Metal, PTFE-Lined/Metal, Thermoplastic, Rubber, Vinyl, PFA



## Modular Solutions

- O-ring and metal-to-metal sealing technologies suitable for instrumentation and ultrahigh-purity applications
  - Compact footprint
  - Lightweight, easy-to-assemble
  - Wide variety of surface-mount components available
- Types:** Analytical MPC, Ultrahigh-Purity, VCR®, Modular Components, Configuration Software, System Assembly



## Filters

- Available for liquid and gas service
  - Welded, inline, and tee-type configurations
  - Wide variety of filter media available
  - Membralox® ceramic filtering technology for high-purity applications
- Types:** Coalescing, Particulate, High-Purity



## Sample Cylinders

- Sizes from 10 to 3750 cm³ (1 gal)
  - 304L, 316L, and Alloy 400
  - Working pressures up to 5000 psig (344 bar)
  - Variety of options including integral valves, outage tubes, color coding, and specialty coatings
- Types:** Sampling, Transportation-Compliant (DOT, TSPD, Transport Canada, CCO), Single- and Double-Ended



## Quick-Connects

- Designed to minimize spillage and air inclusion
  - Push-to-connect design enables quick, simple operation. No twisting, turning, or wrenching necessary
  - Wide variety of configurations, end connections, and stem and body connectors
- Types:** Instrumentation, Single-End Shutoff, Double-End Shutoff, Full-Flow, Miniature, PTFE-Sealed



## Tubing and Tube Supports

- Stainless steel, copper, and PFA tubing
  - Sizes from 1/16 to 4 in. OD and 3 to 25 mm OD
  - Standard instrumentation and ultrahigh-purity tubing
  - Tube support system for tube and hose sizes 1/4 to 1 in. and 6 to 25 mm
- Types:** Chemically Cleaned and Passivated Tubing, Sanitary Tubing, Ultrahigh-Purity Stainless Steel Tubing, Medium-Pressure Heavy-Walled Annealed Tubing



## Tools and Accessories

- Tube benders, swaging units, gap inspection gauges
  - Variety of wrenches, cutting tools, and deburring tools
  - Liquid leak detectors, thread lubricants, and sealants
- Types:** Electric, Bench-Top, and Hand Tube Benders, Hydraulic Swaging Units, Snoop® and Goop® Products

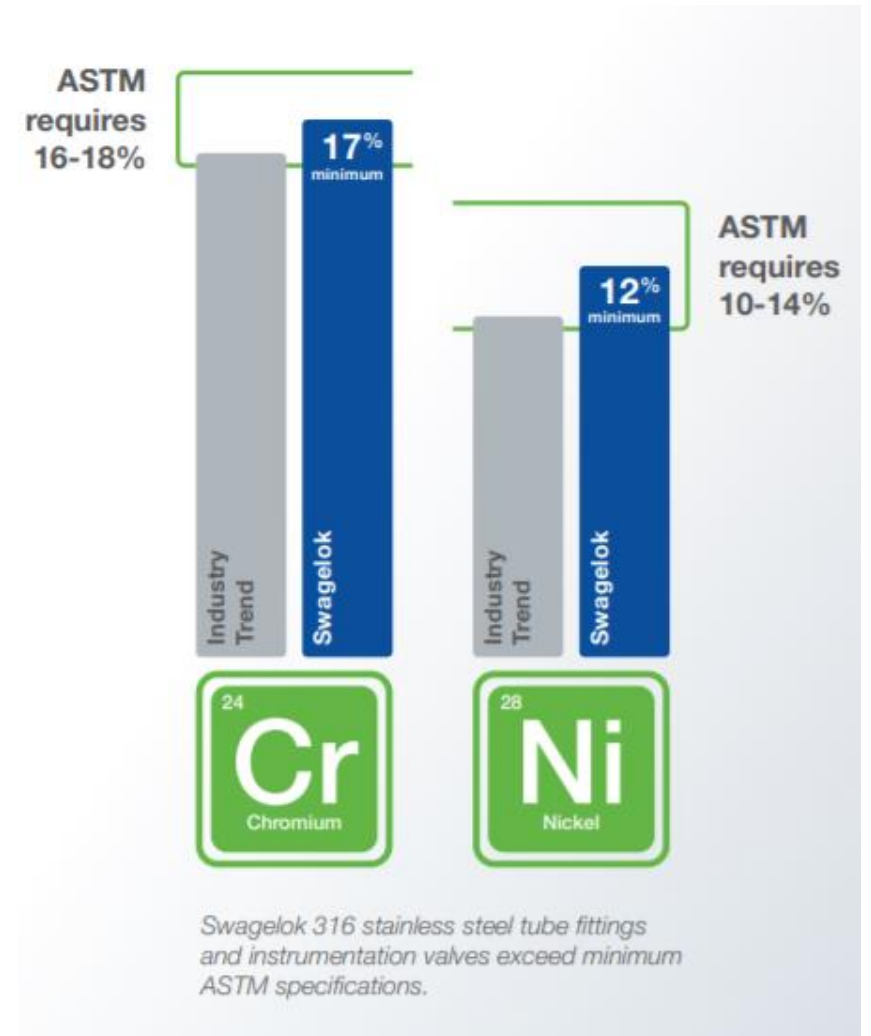
# Swagelok Unmatched Material Quality

## 316 Stainless Steel

In all stainless steels, chromium and nickel are critical for corrosion resistance and ductility. The addition of >10% chromium transforms steel into stainless steel, creating an adherent and invisible oxide layer that is chromium-rich. This oxide layer forms when chromium in the alloy reacts with oxygen in ambient air. This layer gives steel its stainless character. The addition of nickel provides good ductility and ease of forming and welding.

But not all bar stock is the same. Swagelok 316/316L stainless steel tube fittings and instrumentation valves contain more nickel and chromium than minimally required by ASTM standards for bars and forgings.

Note that although stainless steels will not suffer from general corrosion, they can be affected by localized corrosion.





# Achieve More With the Help of Local Fluid System Specialists

Swagelok

Every day, experienced Swagelok® professionals apply their technical and application expertise to help customers across the globe solve pressing challenges related to fluid system design, installation, operation, and maintenance.

Swagelok onsite services can develop and prioritize solutions to help you:

- Improve reliability and performance
- Promote onsite safety
- Reduce operating costs
- Boost system productivity
- Mitigate environmental risk and reduce emissions
- Increase sampling reliability



# Onsite Services Help Promote Safety

Protect your people, systems, and reputation from potential safety incidents or violations by using Swagelok field engineers to recommend and help prioritize the implementation of solutions and supervise installation as needed. Capabilities include:

- Process and design recommendations
- Personalized training
- Product selection assistance
- Leak identification
- Fluid, sample, and steam system analysis





# Onsite Services Help Reduce Costs

Swagelok field engineers can uncover the most efficient and effective means of reducing costs related to fluid system operations and maintenance by identifying:

- Design optimization opportunities
- System standardization opportunities
- Installation errors
- Costly leak points
- Ideal components for the application



# Onsite Services Help Increase Uptime and Reliability



Swagelok fluid system experts help you maintain the health of your fluid systems, avoiding equipment downtime, lost production revenue, and unnecessary troubleshooting and repairs. Our ability to find and measure the scale of fluid system problems, prioritize improvement recommendations, and supervise installation will help you with:

- Optimized sampling system design
- High-quality component selection for peak life span
- System component documentation for easy reorder
- Leak detection and potential failure point identification
- Hose selection, documentation, installation, and maintenance recommendations





# Onsite Services Help Optimize Resources

If you're being asked to do more with reduced budgets and fewer experienced staff, we can help you make the most of your limited resources. Receive recommendations to streamline system installation, lower maintenance and repair requirements, and improve system designs. Through onsite services, we offer:

- Design services
- Fabrication and assembly services
- Training on product installation and best practices
- Product selection consulting
- Bill of materials (BOM) and piping and instrumentation diagram (P&ID) generation
- Leak identification and repair prioritization
- Preventive maintenance recommendations





# Our Onsite Services

Whether you are seeking to ensure reliable fluid system operation, boost process efficiency, reduce unplanned downtime, increase processing margins, lower operating costs, or all of the above, find out how you can move closer to achieving your goals through Swagelok® onsite services.

Explore Swagelok Onsite Services:

- Fluid System Evaluation & Advisory
- Sampling System Evaluation & Advisory
- Grab Sampling Support
- Hose Advisory
- Measurement Device
- Fabrication, Assembly & Build
- Invasive Tube Fitting Inspection
- Mechanical Seal Support System
- Regulators



# Fluid System Evaluation & Advisory Services

Have our field engineers conduct a site evaluation of your facility, detect and calculate costs of leaks, advise on design and installation practices, and recommend prioritized system enhancements in a comprehensive report. Our report will provide solutions that address vibration concerns, corrosion potential, incorrect component choice or installation, inadequate supports, and more.

Receive the insights you need to:

- Improve fluid system performance, productivity, and reliability
- Enhance the safety of your fluid systems
- Reduce costs related to downtime
- Mitigate environmental risks and reduce emissions

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[VIDEO: Hear Field Engineers Explain How They Work With Customers](#)





# Sampling System Evaluation & Advisory Services

Improve sampling system reliability, reduce operating and maintenance costs, and identify unseen opportunities for system improvement with our expert, in-depth analysis of every sampling system component and subsystem, from tap to analyzer.

We document your existing sampling systems and provide a detailed report, helping you:

- Decrease time delays
- Obtain more representative samples
- Eliminate causes of poor sample quality
- Reduce required maintenance and analyzer calibration/downtime
- Resolve issues caused by high particulate loads
- Make the right design choices and integrate the right assemblies

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[DISCOVER THE PROCESS](#)

[VIDEO: How We Solve Common Sampling System Challenges](#)





# Grab Sampling Support

Without proper grab sampling system design and maintenance, critical actions like capturing, handling, or analyzing samples that are timely and representative of your process can be difficult to achieve. Work with our experts to produce more accurate, compliant, safe samples while reducing your costs.

Our team of certified fluid system specialists can:

- Identify issues affecting sample quality and compliance
- Provide insights to make grab sampling systems safe and more accurate
- Reduce required maintenance and analyzer downtime by optimizing system design
- Design and assemble reliable, tested grab sampling systems

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[ARTICLE: See How to Reduce Plant Costs with Smarter Grab Sampling](#)



# Hose Advisory Services

Eliminate a variety of hose-related issues that cause safety concerns, unplanned downtime, low product yield, or costly part replacements by engaging with Swagelok hose advisors who conduct site evaluations and provide prioritized improvement recommendations.

We help you by:

- Providing feedback on hoses, installation, inspection, and maintenance
- Explaining hose selection criteria to improve hose life and performance – check compatibility with media and related pressure and temperature
- Suggesting standardized end connections and couplings
- Developing preventive maintenance schedules and managing inventory
- Documenting hose installation and wear concerns

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[VIDEO: See How Hose Advisory Services Can Benefit You](#)





# Measurement Device

Measurement devices are key critical to understanding what is going on inside your processes. Temperature, pressure and flow monitoring is essential process information for your operation to run efficiently and safely.

Let us put our experience to advise on right components and maintenance plans for your company.

- Check if the device is operational
- Check compatibility with media and necessary technology
- Working range
- Review with the Instrumentation team the calibration for the devices and create a strategic plan to ensure effective transition & interchange
- Check ergonomics and orientation

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## FAB - Fabrication, Assembly & Build

Allow our Swagelok engineers to conduct a fabricated system review detailing major observations and propose solutions for your challenges.

Our dedicated team of experts can review and assist in delivering a comprehensive review on your systems in aim to:

- Locate and improve possible mechanical defects
- Optimize operator safety and improve ease of use
- Reduce costs and labour time by sound engineering
- Deliver advice on material compatibility
- Provide recommendations which are prioritized for largest impact, from necessary through to enhancements.

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[DISCOVER THE PROCESS](#)



# Mechanical Seal Support System

Our knowledge of high-performance components coupled with our seal support system experts is where we can use our experience to assess your mechanical seal support systems. We can advise, in detail, to give you the best uptime, long working life and reliable installation.

Tagging identified areas of the plant observed, we'll help you:

- Ensure seal support systems and hook-up adheres to API and other relevant standards and sites specifications
- Increase reliability & reduce maintenance time, reviewing safety concerns around component selection
- Work on issues observed by you and assist root cause analysis methodology.
- Determine defective components under normal operation activity, avoid incorrect installation practice that could lead to fatigue failure
- Offer a variety of custom configurations to cover a range of conditions to match your needs

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# Invasive Tube Fitting Inspection

Tube fittings are reviewed by our dedicated engineers who carry out invasive and non-invasive observation to ensure your assemblies meet the Swagelok Standard. We typically inspect 10-20% of an assemblies tube fittings. Before your assembly is shipped, you know it's been independently reviewed by *the* fluid system experts.

With images included for each point of inspection, our areas of review will consist of:

- Visual examination of a predetermined number of tube fittings, pinpointing issues such as; intermixed / interchanged components, tube preparation, ferrule installation, damage, over tight / under tight fittings, excessive use of PTFE tape.
- Suggested corrective actions for errors and also noted issues that were observed and corrected.
- Statistics report showing quantity of fittings surveyed and number of issues discovered and resolved.

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# Regulators

Encompassing process regulators, entire gas distribution systems and end of line point of use pressure control. We have in-depth knowledge of how these systems should be specified to give maximum performance.

We start with simple data such as pressures and flow requirements, we go onto review the entire system to verify the best regulators are specified for the duty. Either currently installed or planned future works.

We'll work to:

- Issue overall feedback on the correct choice of regulators for your application.
- Review system details such as leakage, media safety, compatibility, system protection, tube routing, media separation and more.
- Review regulator details such as droop, SPE, Choke, pressure drop, hysteresis, feedback, isolation, venting, stages and more.

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# Discover the Swagelok Difference

Swagelok® onsite services are driven by local field engineers and fluid system specialists who provide rapid support, application expertise, and actionable recommendations to help customers increase operator safety, decrease costs, and improve profitability.

When you work with Swagelok, you have access to a team that:

- Is engineered to perform under pressure, built upon a foundation of success started 70+ years ago
- Completes a rigorous training and development program taught by recognized industry experts
- Has experience working with diverse industrial fluid systems and OEM equipment packages
- Is supported by a global network of experienced professionals with ties to more than 200 authorized sales and service centers in 70 countries
- Has designed and optimized systems that overcome challenges for a broad variety of customers worldwide

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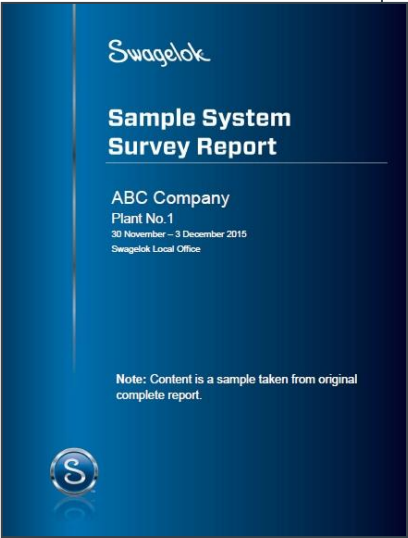
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# Make More Informed Decisions

Upon completion of our onsite services, you will receive a comprehensive report that identifies key issues and recommended solutions, including:

- Costs of existing, unrepaired leaks
- Concerns categorized by severity
- Photos to clearly identify locations of problems
- Steps that can be taken to remedy them



**Sample System Survey Report**

**Conclusion**

Remediation of the existing system will include options 1-5 or 1-4 and 6 above. Option 7 should be considered in isolation.

- Eliminate leaks and ensure all joints are enclosed within heated, nitrogen purged enclosures to minimize the ingress of environmental moisture.
- Reduce temperature of heat tracing to minimize possibility of sample component polymerization. Maintain a constant temperature on all traced sample lines to prevent condensation forming in low-temperature zones.
- Minimize sample system volume and eliminate or reduce dead legs to improve system response time.
- Use welded or VCR connections and packless valves and barrier coils to minimize the ingress of environmental moisture into the system.

**2.4 Improvement Roadmap**

	Priority	Estimated Value	Cost to Implement
Install additional support at Sample Probe	1	★	\$
Reinstate Nitrogen purge of enclosure	2	★★	\$
Identify and repair leaks in transport lines	3	★★★	\$
Clean the Sample Transport lines as required	4	★★★	
Complete tracing of cold spots in existing system	5	★★★	\$\$\$
Replace Steam Tracing with Electric to reduce transport line temperatures	6	★★★★★	\$\$\$\$
Install replacement system	7	★★★★★	\$\$\$\$\$

**Note:** Completing steps 1 - 5 above will improve the performance of the system; however, it may ultimately prove more costly and less effective than installing a new system, per recommendation 7.

**APR Plan Type** Plan 53A **Issue #** 149

**Plant Number** MP-007A  
**Unit Name** Epoxy 2 - Hybrid  
**Location** Hybrid - D-307

**General Information**

Tubing Material	Stainless steel	tubing touches the shroud
Tubing Size	1/2"	piping left check valve not always as effective
Bulk NPT Connection	Flange inside shroud 1/2"	
Set at Hot Connection Type	NPT	
Set at Hot Connection Size	1/2"	
Blower Fluid	air/foam	
Temperature	6000	subbed 25 psig
Pressure	25	Gal
Put Volume	2.14	
Put Manufacturer	Set a Connect	
Put Material	Stainless steel	
Put Style	flat weld caps	
height of sample connection	25"	
height of gas pot return point	20"	
height of 0% nitrogen	45"	
height of 100% nitrogen	55"	

**Customer Specified Minimum Components**

	Existing (Y/N)	Functioning (Y/N)	Deficiency (Y/N)
No/Shared Pressure Regulator	Y	Y	Y
Level Sensing For Below Recommended Pot	Y	Y	Y
No pot available for gas fill events	Y	Y	Y
No local level indication	Y	Y	Y

**APR Minimum Components**

	Existing (Y/N)	Functioning (Y/N)	Deficiency (Y/N)
Put Drain Valve	Y	Y	Y
Level Sensing For Below Recommended Pot	Y	Y	Y
Put Quick Fill Solution	Y	Y	Y
Long Radius Tubing Bends	Y	Y	Y
Minimum 1/2" sizing (3/4" recommended)	Y	Y	Y

**Recommended Components**

	Existing (Y/N)	Functioning (Y/N)	Recommendation (Y/N)
Pressure Gauge	Y	Y	Y
Pressure Transmitter	Y	Y	Y
Temperature Gauge	Y	Y	Y
Level Switch Hi/Low	Y	Y	Y
dP Level Transmitter	Y	Y	Y
Local Level Indication	Y	Y	Y
Inline Low Point Drain	Y	Y	Y
Cooling Coil	Y	Y	Y

**System Rating**

Customer Specified Deficiencies	3
APR Deficiencies	2
Recommendations	5

**Other Considerations (Y/N)**

PPE Type	Y	Do Not use PPE base on small systems
Unnecessary Threaded Fittings	Y	Eliminate unnecessary fittings
Block & Bleed on Pot	Y	Improves Maintainability
Relief Valve/ Back Pressure Regulator	Y	Relieve Excess Pressure

**Typical APR Schematic (Optional Features in Red)**





