Swagelok® **Engineering Services**

Local Solutions. Global Support.

Swagelok

Swagelok® Engineering Services

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Achieve More With the Help of Local Fluid System Specialists

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.

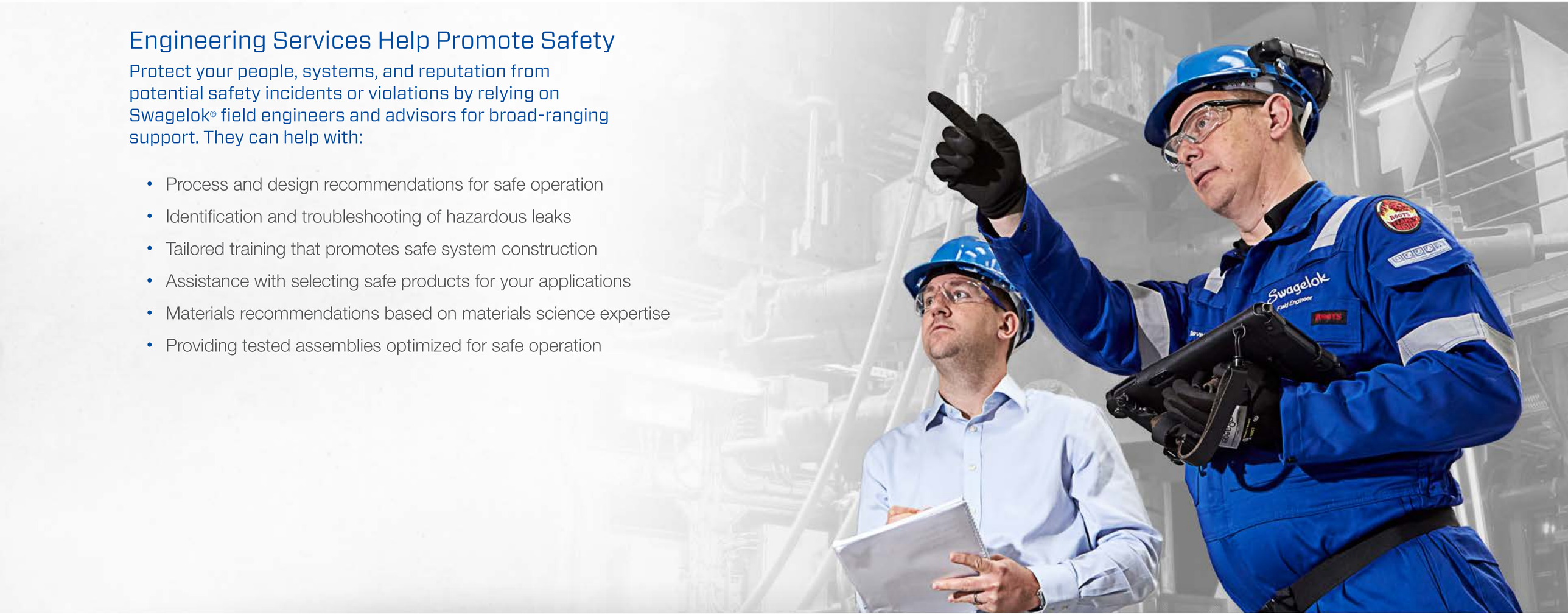
Through Swagelok engineering services, fluid system specialists can help you:

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

Engineering Services Help Promote Safety

Protect your people, systems, and reputation from potential safety incidents or violations by relying on Swagelok® field engineers and advisors for broad-ranging support. They can help with:

- Process and design recommendations for safe operation
- Identification and troubleshooting of hazardous leaks
- Tailored training that promotes safe system construction
- Assistance with selecting safe products for your applications
- Materials recommendations based on materials science expertise
- Providing tested assemblies optimized for safe operation



Engineering Services Help Reduce Costs

Swagelok® engineers can help you uncover the most efficient and effective means of reducing costs related to fluid system operation and maintenance. They provide support through:

- Fluid transfer, sampling, and steam system analysis and efficiency recommendations
- Delivery of standardized assemblies configured for your application
- Oversight during installation to minimize costly errors
- Discovery of costly leak points and improvement advice
- Design, installation, and component selection training
- Capital project support to help you stay on schedule

Engineering Services Help Increase System Uptime and Reliability

Swagelok® fluid system experts help you maintain the health of your fluid systems, minimizing equipment downtime, lost production revenue, and unnecessary troubleshooting and repairs. They can help you:

- Find and measure the scale of fluid system problems
- Prioritize improvements to improve uptime
- Optimize your fluid handling and sampling system design
- Select high-quality components designed to last
- Supervise major system installations to help workers avoid mistakes
- Create maintenance plans and documentation for easy reordering
- Train your sampling team to improve system accuracy
- Design and assemble reliable, configurable fluid subsystems

Engineering Services Helps You Do More With Less

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. Through engineering services, fluid system specialists can:

- Provide recommendations to expedite system installation
- Design fluid subsystems based on your designs or new ones
- Fabricate fully tested, proven fluid system assemblies
- Recommend ways to lower maintenance and repair requirements
- Provide training on product installation and troubleshooting
- Generate bills of materials and piping and instrumentation diagrams
- Identify leaks and provide preventive maintenance recommendations
- Streamline capital development project logistics

Field Engineering

Whether you need more reliable fluid system operation to boost process efficiency, reduce unplanned downtime, increase processing margins, lower operating costs, or all of the above, Swagelok field engineers can help you develop effective responses to your most pressing fluid system-related challenges.

- Meet regulatory demands related to safety and emissions through leak detection and risk mitigation.
- Increase productivity and yields from your fluid systems through design enhancements and troubleshooting.
- Reduce operating costs throughout your facilities by minimizing maintenance requirements and improving system performance.
- Maintain or increase overall profitability by making uptime and process improvements.
- Replace business knowledge that has “walked out the door” through consultation and training.

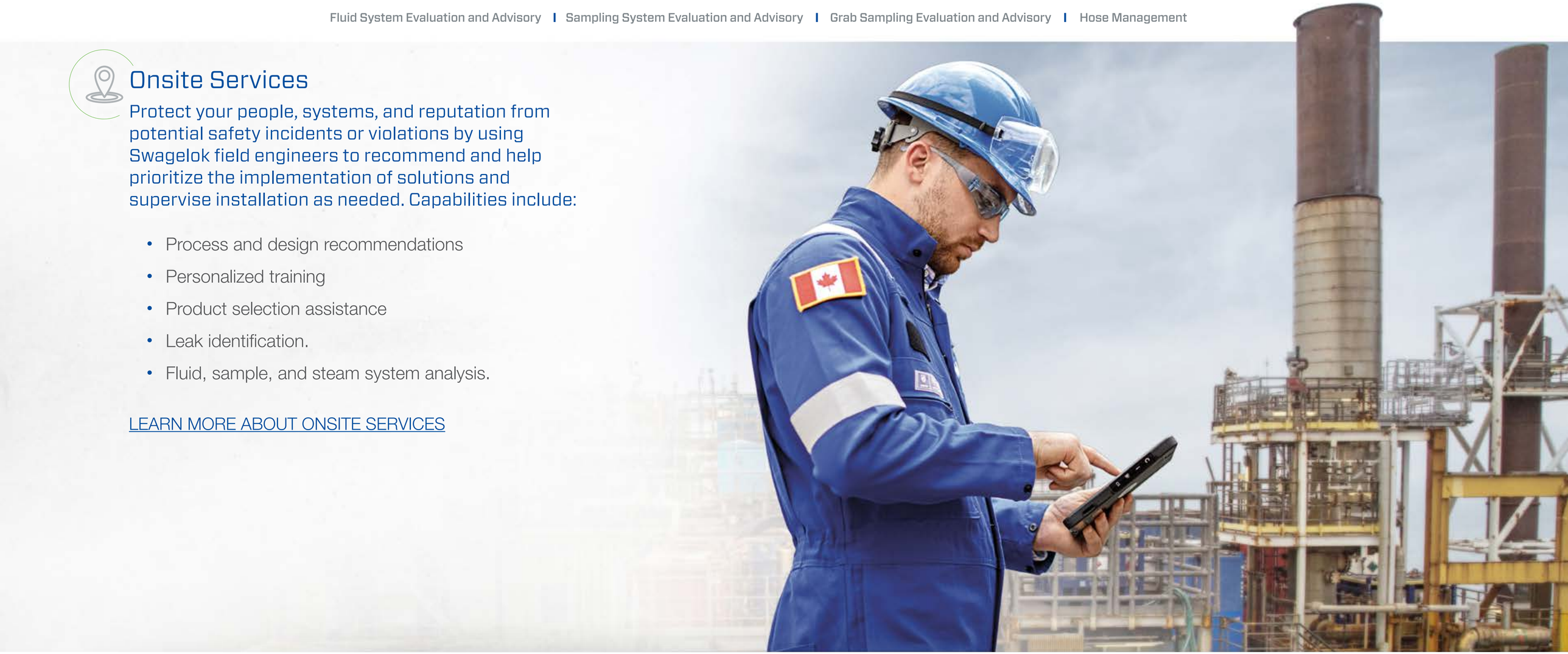
LEARN MORE ABOUT FIELD ENGINEERING

Onsite Services

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.

LEARN MORE ABOUT ONSITE SERVICES



Fluid System Evaluation and Advisory

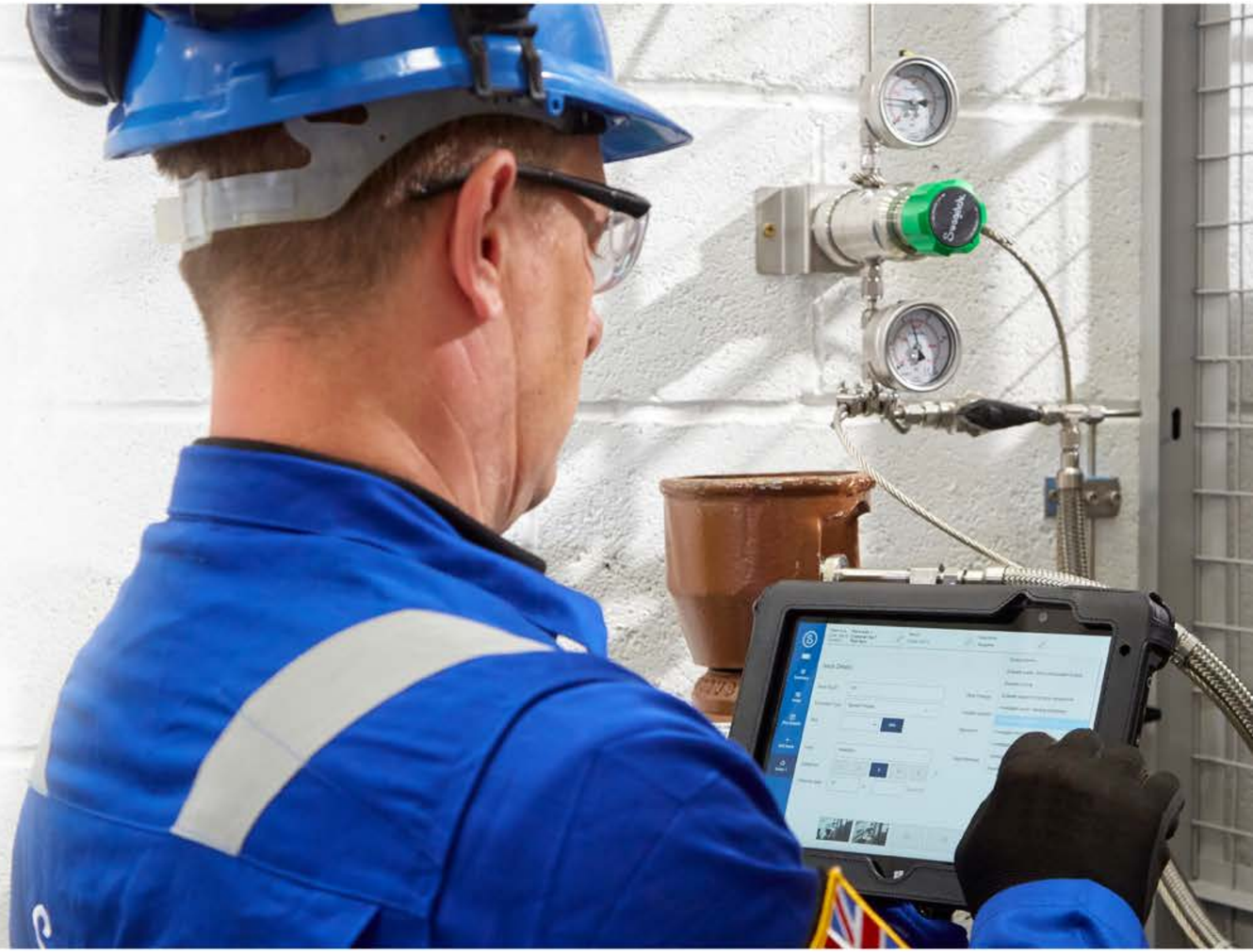
Have our field engineers conduct a site evaluation of your facility, detect and estimate costs of leaks, advise on design and installation practices, and recommend prioritized system enhancements in a comprehensive report. Our report will provide solutions that address vibration concerns, corrosion potential,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

LEARN MORE ABOUT FLUID SYSTEM EVALUATION AND ADVISORY

VIDEO: HEAR FIELD ENGINEERS EXPLAIN HOW THEY WORK WITH CUSTOMERS



Sampling System Evaluation and Advisory

Improve sampling system reliability, reduce operating and maintenance costs, and identify unseen opportunities for system improvement with our 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 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

LEARN MORE ABOUT SAMPLING SYSTEM EVALUATION AND ADVISORY

ARTICLE: READ ABOUT 3 RULES TO HELP WITH ANALYZER ACCURACY

Grab Sampling Evaluation and Advisory

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 panel downtime by optimizing system design
- Design and assemble reliable, tested grab sampling systems

LEARN MORE ABOUT GRAB SAMPLING EVALUATION AND ADVISORY

ARTICLE: SEE HOW TO REDUCE PLANT COSTS WITH SMARTER GRAB SAMPLING

Hose Management

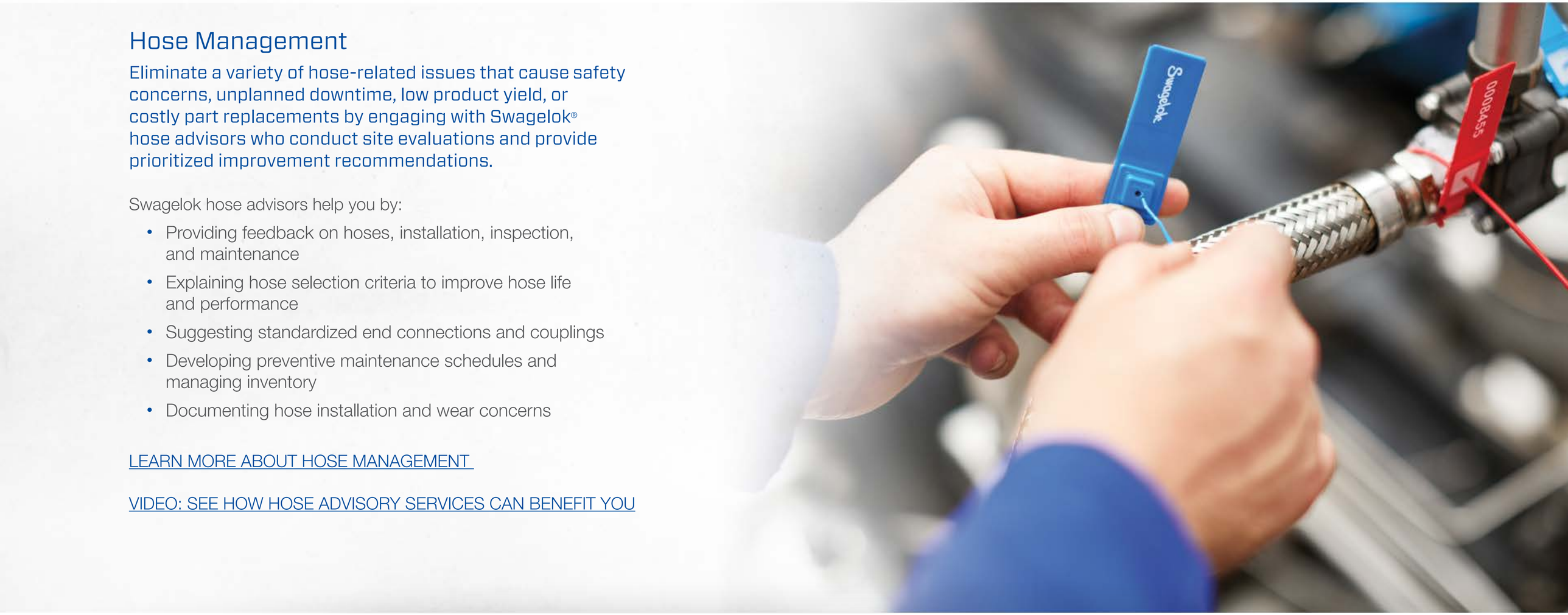
Eliminate a variety of hose-related issues that cause safety concerns, unplanned downtime, low product yield, or costly part replacements by engaging with Swagelok® hose advisors who conduct site evaluations and provide prioritized improvement recommendations.

Swagelok hose advisors help you by:

- Providing feedback on hoses, installation, inspection, and maintenance
- Explaining hose selection criteria to improve hose life and performance
- Suggesting standardized end connections and couplings
- Developing preventive maintenance schedules and managing inventory
- Documenting hose installation and wear concerns

LEARN MORE ABOUT HOSE MANAGEMENT

VIDEO: SEE HOW HOSE ADVISORY SERVICES CAN BENEFIT YOU



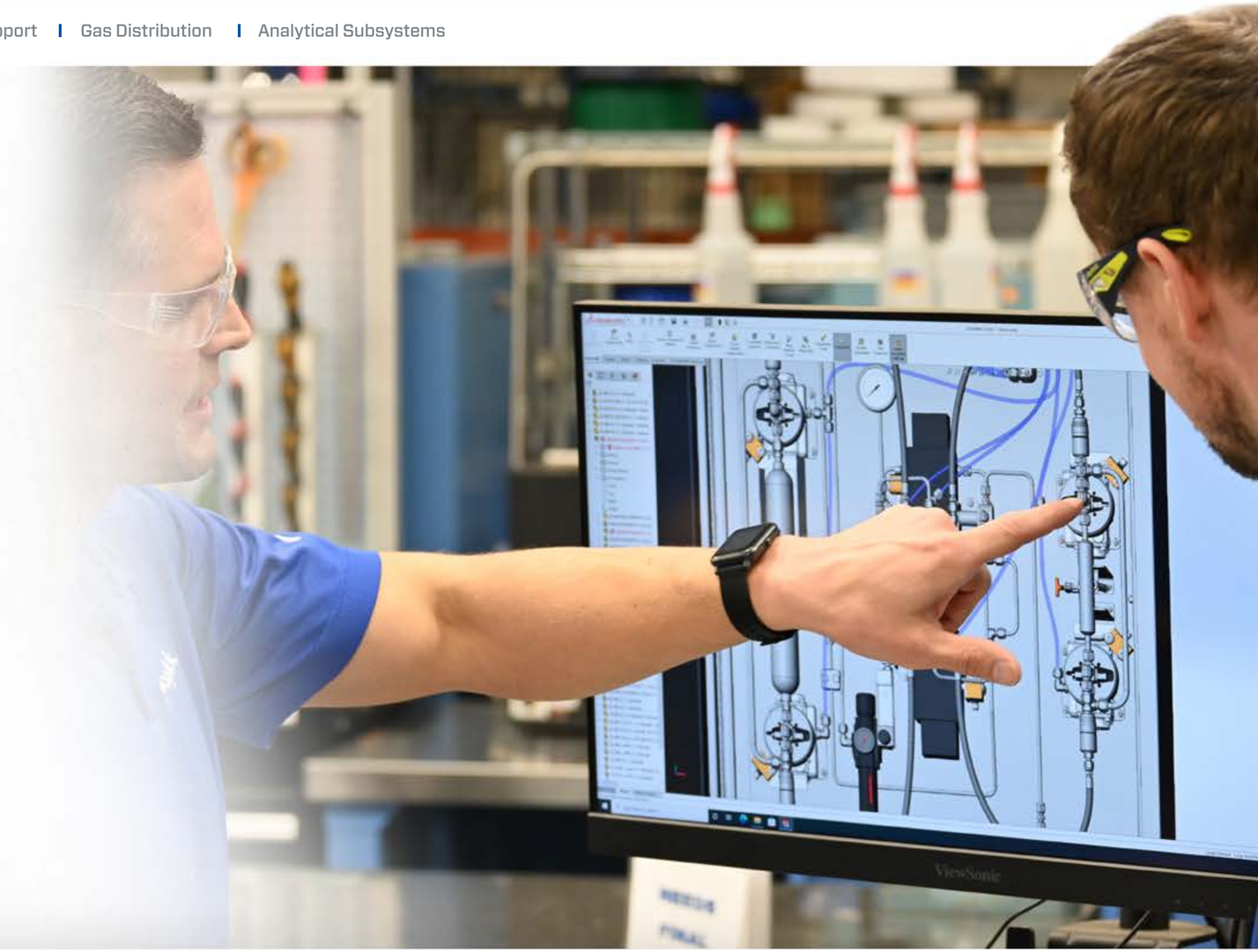
Save Time With Standard and Configurable Fluid System Assemblies

If you are short on time and labor, Swagelok® technicians can fabricate your fluid system assemblies for you. You will receive a professionally designed, repeatable solution with testing, inspection, and packaging included—all backed by the Swagelok Limited Lifetime Warranty.

We call these assemblies Swagelok® Custom Solutions. Custom Solutions are:

- Small or large assemblies, from a few components to complete panels or enclosures
- Always built from high-quality Swagelok components, with optional features like wiring, automation, transmitters, and more
- Built to your specific parameters
- Engineered to meet your unique needs

LEARN MORE ABOUT DESIGN AND ASSEMBLY SERVICES



Grab Sampling Systems

Capture, handle, and analyze your process samples more easily with Swagelok® grab sampling systems. We offer fully configurable assemblies in a variety of configurations, specifically engineered to meet your needs, with advanced features that can help you:

- Enhance safety
- Save time
- Gain deeper insight into your process

Whether you need closed-loop sampling into pressure-rated sample cylinders or want to collect liquids and nonvolatile process fluid into glass laboratory bottles for analysis, we offer ideal sampling panel options that are safe, intuitive, easy to maintain, and can be ordered with a single part number.

LEARN MORE ABOUT GRAB SAMPLING SYSTEMS

WHITE PAPER: LEARN BEST PRACTICES FOR GRAB SAMPLING

Mechanical Seal Support Systems

Need to keep rotating equipment online and operating efficiently? We can help. Our engineers design and construct simple-to-configure, easy-to-maintain, and safe-to-operate seal support systems that can help you:

- Minimize downtime
- Reduce costs
- Enhance operational efficiency

Our seal support systems are available in various American Petroleum Institute (API) plan configurations to suit your needs and are assembled according to industry best practices as detailed in the fourth edition of the API Standard 682: Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps.

LEARN MORE ABOUT SEAL SUPPORT SYSTEMS

ARTICLE: BUILDING BETTER MECHANICAL SEAL SUPPORT SYSTEMS

Gas Distribution Systems

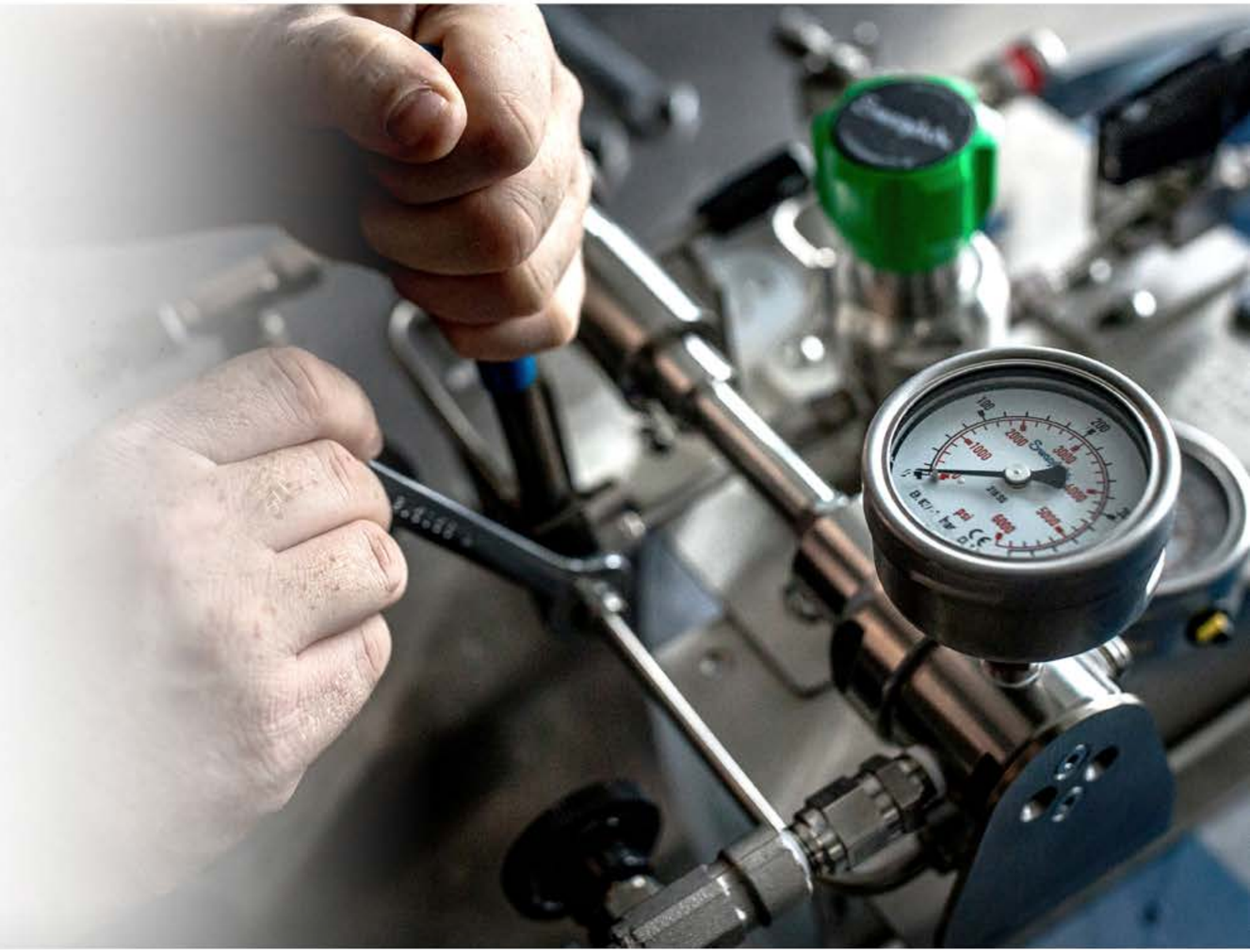
Have an application that requires a reliable supply of certain process gasses? Our engineers can provide a configurable gas delivery system that is right for you. We offer standardized and customizable systems to help you:

- Protect system operators
- Increase uptime
- Improve process accuracy and repeatability

We design Swagelok® gas distribution systems based on best practices. Our modular panels feature minimal threaded connections to reduce potential leak points, and they are intuitively labeled to promote safety, simple use, and maintenance. All our gas distribution systems are backed by the Swagelok Limited Lifetime Warranty.

LEARN MORE ABOUT GAS DISTRIBUTION

ARTICLE: HOW TO REDUCE COSTS AND IMPROVE SAFETY WITH MORE-EFFICIENT GAS DISTRIBUTION



Analytical Subsystems

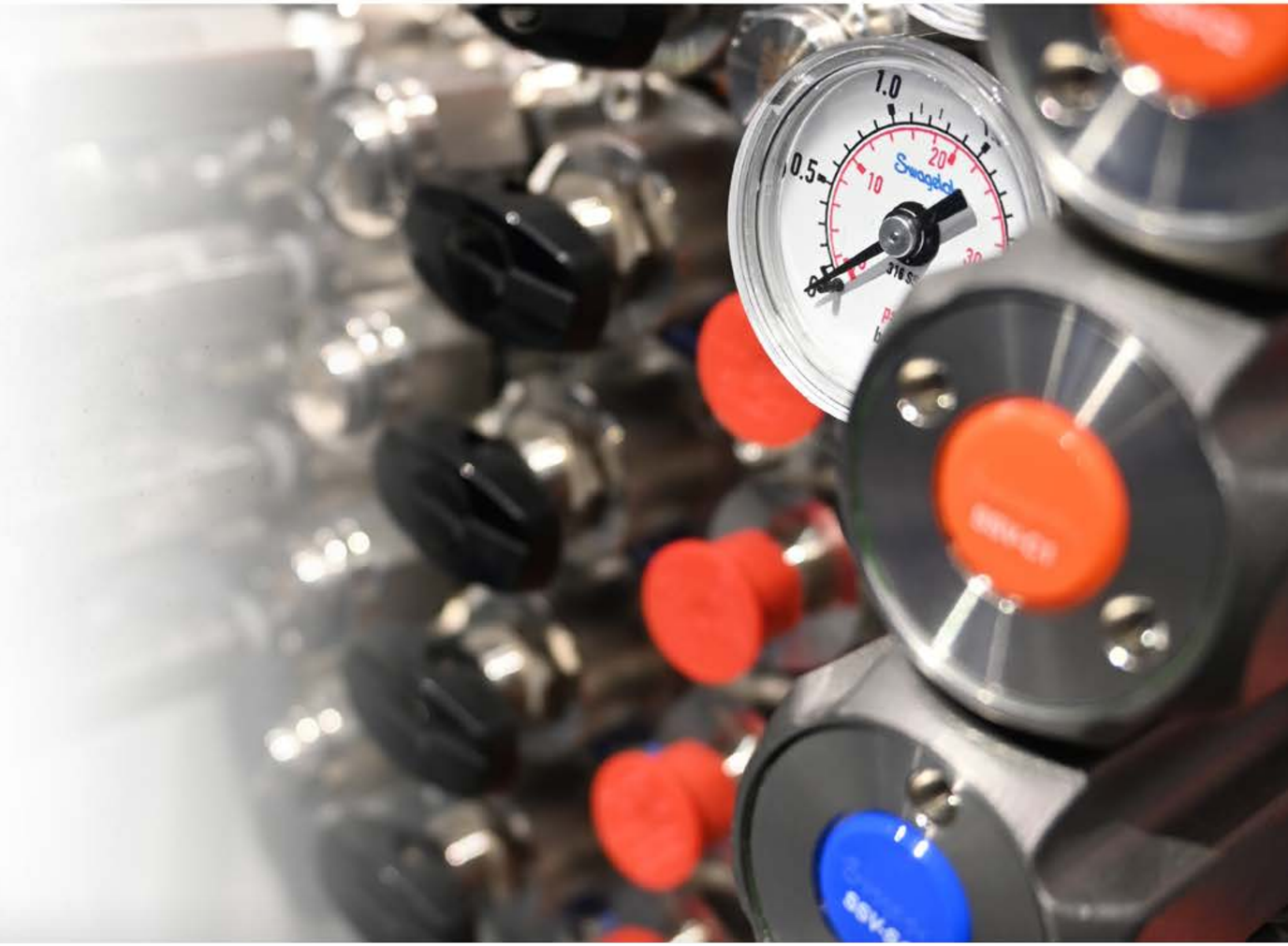
Swagelok® pre-engineered subsystems (PrESS) for analytical applications are designed and assembled by fluid system specialists to be compact, accurate, and convenient to use, helping you:

- Minimize system footprints
- Simplify system design
- Promote representative samples and analytical results

Use PrESS to deploy fully documented fluid sampling and control systems without the worry of acquiring and assembling multiple parts.

LEARN MORE ABOUT ANALYTICAL SUBSYSTEMS

ARTICLE: IMPROVING ANALYTICAL INSTRUMENTATION



Expand Your Knowledge With Training From Engineering Specialists

Swagelok® training programs provide a range of valuable and practical tools for meeting day-to-day challenges related to fluid and sampling systems. In-depth, hands-on courses taught by experienced instructors help both new team members and industry veterans. Our courses will help your team gain foundational knowledge about:

- Fluid and sampling system design
- Operation and maintenance
- Installation
- Critical componentry

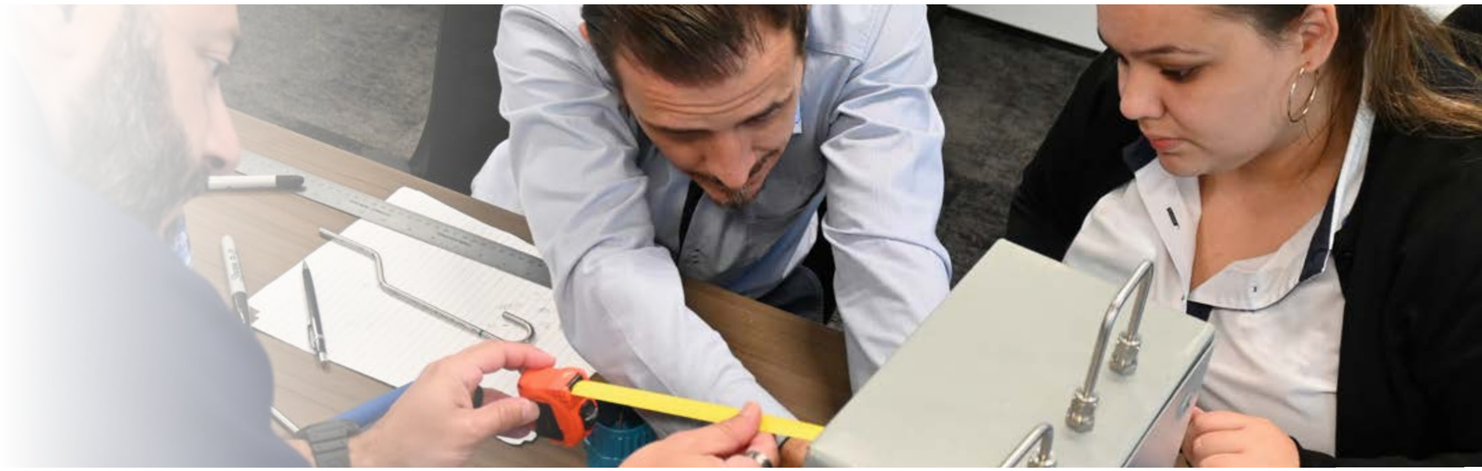
Whether you need to build a foundational understanding of fluid and sampling systems or want to stay up to date on the latest technologies and best practices, Swagelok offers robust training options.

LEARN MORE ABOUT TRAINING OPPORTUNITIES

Swagelok Essentials Training

Swagelok® Essentials training provides critical skills for developing, building, and maintaining dependable fluid systems. With a broad range of courses covering critical topics, beginners and seasoned professionals alike can benefit from our training, helping you:

- Reduce fluid system leaks
- Improve operational efficiency
- Drive down maintenance costs



Taught by Swagelok-certified trainers at locations and times convenient to you, these courses provide the foundational knowledge and techniques needed to build and operate high-performing fluid systems.

LEARN MORE ABOUT SWAGELOK ESSENTIALS

ARTICLE: HOW TRAINING CAN HELP BRIDGE THE SKILLS GAP

Swagelok Essentials courses include:

- Tube Fitting Installation Inspection Essentials
- Medium- and High-Pressure Cone and Thread Essentials
- Valve Essentials
- Hose Essentials
- Tube Bending Essentials
- Regulator Essentials
- VCR® and VCO® Fitting Essentials
- FK Fitting Essentials

Orbital Welding Training

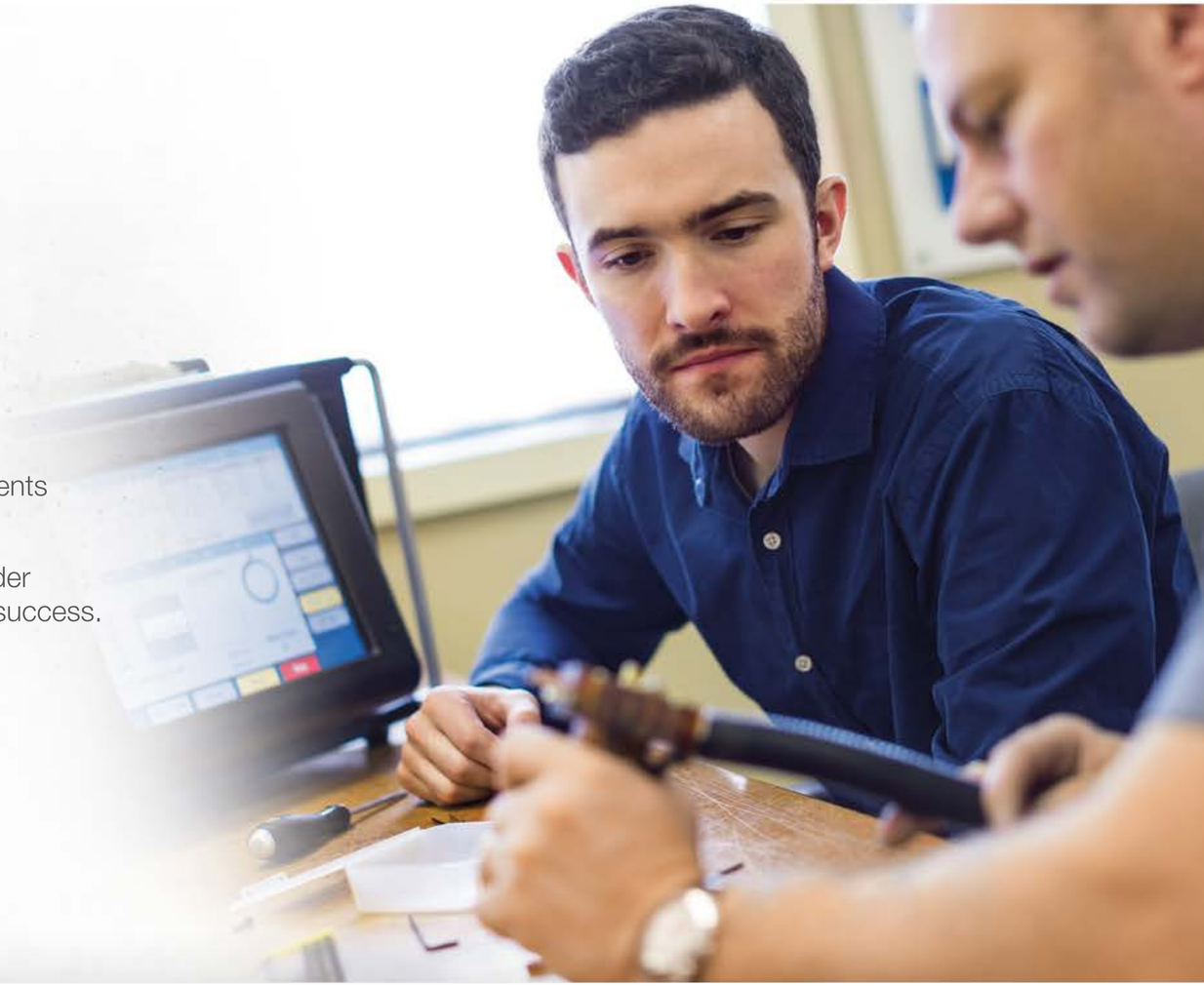
Welding is a critical fluid system assembly skill. We can help equip your team with the knowledge to do it effectively and consistently. The Swagelok® M200 welding system, makes it easy to produce precise, consistent, quality welds. Our five-day training program is designed to help you:

- Gain an understanding of welding principles
- Understand setup and operation of the Swagelok M200 orbital welding system
- Troubleshoot frequently encountered welding problems
- Avoid operational issues through hands-on experience
- Optionally test for ASME Section IX qualification if you need to fulfill QA/QC requirements

While automatic orbital welding can help you overcome issues related to widespread welder shortages, proper orbital welding training is essential to equip your emerging welders for success.

LEARN MORE ABOUT ORBITAL WELDING TRAINING

ARTICLE: TOOLS FOR THE EMERGING WELDING WORKFORCE



Materials Science Training

Swagelok® materials science training courses teach you how to choose the right corrosion-resistant materials to help you keep your fluid systems leak-tight and operating efficiently. Beneficial for new team members and seasoned professionals alike, this course teaches you:

- Which specific alloys resist corrosion and how they do it
- How various materials behave
- How industry standards impact your material choice

A strong understanding of materials science is invaluable for every industry where fluid systems are critical to regular operations. Swagelok engineering specialists have decades of experience specializing in material selection and can help you create corrosion-resistant systems you can count on.

LEARN MORE ABOUT MATERIALS SCIENCE TRAINING

ARTICLE: PITTING CORROSION VS. CREVICE CORROSION: IDENTIFYING THE DIFFERENCES

Advanced Tube Bending

Accurate, reliable tube bending depends on your ability to navigate the variables inherent to different bending applications. And with proper training, careful planning, a positive attitude, and a little practice, almost anyone can successfully bend tube.

Through our tube bending course, you will learn:

- How to apply the Swagelok method of tube bending
- Tips and shortcuts that will help to overcome common challenges in bending tubing
- Variables that must be considered when performing tube bends
- How to identify potential bend defects and explain their causes

Two-, three-, and four-day course options are available depending on the needs of your team and can help you achieve more efficient and reliable fluid system operation.

LEARN MORE ABOUT TUBE BENDING TRAINING

ARTICLE: CASE STUDY: SWAGELOK HELPS GREEN ALTERNATIVE SYSTEMS CONTROL LABOR COSTS WITH TUBE BENDING SOLUTIONS

Sampling Systems Training

We offer a variety of sampling system training courses, taught by experienced engineers. Courses include:

Process Analyzer Sampling System Training

Swagelok® Process Analyzer Sampling System (PASS) training courses demonstrate how to design and optimize process analyzer sampling systems, providing the sound design principles needed to prevent costly sampling system errors. Attendees will learn how to design and build an optimized process analyzer sampling system that delivers timely, accurate results.

LEARN MORE

Process Analyzer Sampling System Subsystems Training

Swagelok® Process Analyzer Sampling System (PASS) Subsystem training courses help sharpen your sampling system design skills. Develop an understanding of complex system subassemblies, then learn how to design them and build them into complete, optimized sampling systems.

LEARN MORE

Sampling System Problem Solving and Maintenance Training

Swagelok® Sampling System Problem Solving and Maintenance (SSM) training courses teach you how to troubleshoot a variety of common sampling system issues from the process line through sample disposal.

LEARN MORE

Build It Globally. Build It With Confidence. Build It With Swagelok.

Managing any large-scale facility construction project can be difficult, and when stakeholders are in multiple continents, projects can become even more complex. Coordination is critical—and we can help.

Swagelok® global construction services offer project management backed by global resources to support international construction projects involving industrial fluid systems. As a leading provider of fluid system components, assemblies, and related services, we are well-positioned to provide what you need to keep global facility construction projects on time and on budget.

We can provide:

- Efficient project management and package vendor management
- Application and materials expertise
- Engineering support to help improve facility design and reduce risk
- Standardized, practical training
- Global capabilities with local support

LEARN MORE ABOUT GLOBAL CONSTRUCTION SERVICES

ARTICLE: TACKLING COMPLEXITY FOR A SUCCESSFUL MEGAPROJECT

Discover the Swagelok Difference

Swagelok® engineering 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 choose Swagelok, you have access to a team that:

- Is engineered to perform under pressure, built upon a foundation of success started 75+ 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

LEARN MORE ABOUT ENGINEERING SERVICES

Swagelok® Engineering Services

Local Solutions. Global Support.

Contact Us

Find out how Swagelok engineering services can help you achieve the fluid system performance you need.

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